CCD-FX200E/FX270E/FX270EP

SERVICE MANUAL

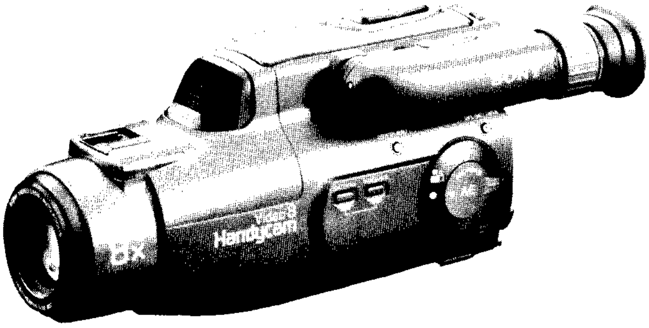


Photo: CCD-FX200E

AEP Model
UK Model
CCD-FX200E
Australian Model
CCD-FX270E
E Model
CCD-FX270E/270EP

Video8
Handycam

A MECHANISM

This service manual only describes the differences between CCD-FX400E and CCD-FX200E/FX270E/FX270EP.
When repairing, use it together with the service manual for CCD-FX400E.
For CCD-FX270E/FX270EP (E Model), use the service manual for CCD-FX300E as well.

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

- CCD-FX200E/FX270E/FX270EP is the original model CCD-FX400E (FX300E) without the remote commander (FX400E), BEEP, EASY CONNECTOR, ZERO MEMO, FADER, BACK LIGHT, and EVENT functions, FX200E has ×8 zoom and FX270E has ×10 zoom.

- For CCD-FX270E/FX270EP (E Model), refer to the table which lists the differences in board names with CCD-FX300E.

CCD-FX300E		CCD-FX270E/FX270EP (E model)	
BOARD	Part No.	BOARD	Part No.
CD-96	A-7063-304-A	CD-61	A-7063-241-A
CK-61	A-7071-687-A	CK-47	A-7071-839-A
CS-37	A-7063-306-A	CS-31	A-7063-586-A
DK-24	1-644-533-21	DK-20	A-7071-840-A
MA-155	A-7063-309-A	MA-93	A-7063-589-A
PJ-50	A-7071-686-A	PJ-45	A-7071-838-A
PK-35	A-7071-689-A	PK-30	A-7071-841-A
PS-308	A-7063-305-A	PS-282	A-7063-588-A
SL-28	A-7063-308-A	SL-22	A-7063-245-A
SW-206	A-7071-685-A	SW-200	A-7071-633-A
VA-77	A-7063-307-A	VA-71	A-7063-587-A
VK-28	A-7071-684-A	VK-22	A-7071-632-A

- Other boards are the same as those of CCD-FX400E.

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

SPECIFICATIONS

Video camera recorder

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 20.051 mm ($^{13}/_{16}$ inch)/sec. LP mode: Approx. 10.058 mm ($^{13}/_{32}$ inch)/sec.
Recording/ Playback time	SP mode: 1 hour 30min. (P5-90) LP mode: 3 hours (P5-90)
Fast-forward/rewind time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	
CCD-FX200E	Combined 8 × power zoom lens f = 6.1 to 48.8 mm ($^{1}/_{4}$ to 1$^{15}/_{16}$ inches) Approx. 44 to 352 mm (1$^{3}/_{4}$ to 13$^{7}/_{8}$ inches) converted into the focal length of a 35-mm still camera.
CCD-FX270E	Combined 10 × power zoom lens f = 6.1 to 61 mm ($^{1}/_{4}$ to 2$^{1}/_{2}$ inches) Approx. 44 to 440 mm (1$^{3}/_{4}$ to 17$^{3}/_{8}$ inches) converted into the focal length of a 35-mm still camera. Filter diameter: 37 mm (1$^{1}/_{2}$ inches) TTL autofocus system inner focus
Colour temperature	Auto
Minimum illumination	4 lx
Illumination range	4 lx to 100,000 lx (0.37 to 9294 footcandles)
Recommended illumination	More than 100 lx (9 footcandles)
Aperture correction	Automatic

Input and output connectors

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack –7.5 dBs, (at load impedance 47 kilohms) impedance less than 1 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote Ⓛ jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	5.7 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 118 × 108 × 265 mm (w/h/d) (4$^{3}/_{4}$ × 4$^{3}/_{8}$ × 10$^{1}/_{2}$ in.)
Mass	Approx. 820 g (1 lb 12 oz) excluding the battery pack, lithium battery, and cassette Approx. 1000 g (2 lb 3 oz) including the battery pack NP-55, lithium battery CR2025, and cassette P5-90
Microphone	Electret condenser microphone, omni directional, monaural type

AC power adaptor

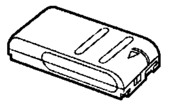
Power requirements	110 – 240 V AC, 50/60 Hz
Power consumption	15 W
Output voltage	DC OUT: 7.5 V, 1.2 A in operating mode Battery charge terminal: 10 V, 1.1 A in charge mode
Application	Sony battery pack NP-55, NP-55H, NP-66H, NP-77, NP-77H, NP-77HD
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to 60°C (–4°F to 140°F)
Dimensions	Approx. 103 × 49 × 63 mm (w/h/d) (4$^{1}/_{8}$ × 1$^{15}/_{16}$ × 2$^{1}/_{2}$ inches) including projecting parts and controls
Weight	Approx. 290 g (10 oz)

Design and specifications are subject to change without notice.

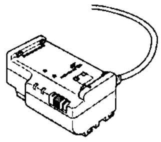
Note
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

Supplied accessories

1



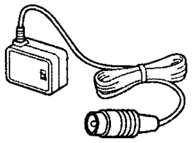
2



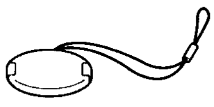
3

CR2025
SONY
+

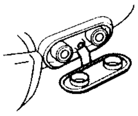
4



5



6



- **1 Battery Pack NP-55 (1)**
- **2 AC Power Adaptor AC-V25 (1)**
- **3 Lithium Battery CR2025 (1)**
- **4 RFU Adaptor RFU-89EA with a screwdriver (1)**
- **5 Lens Cap (1) (attached to the camcorder)**
- **6 Jack Cover (1) (attached to the camcorder)**

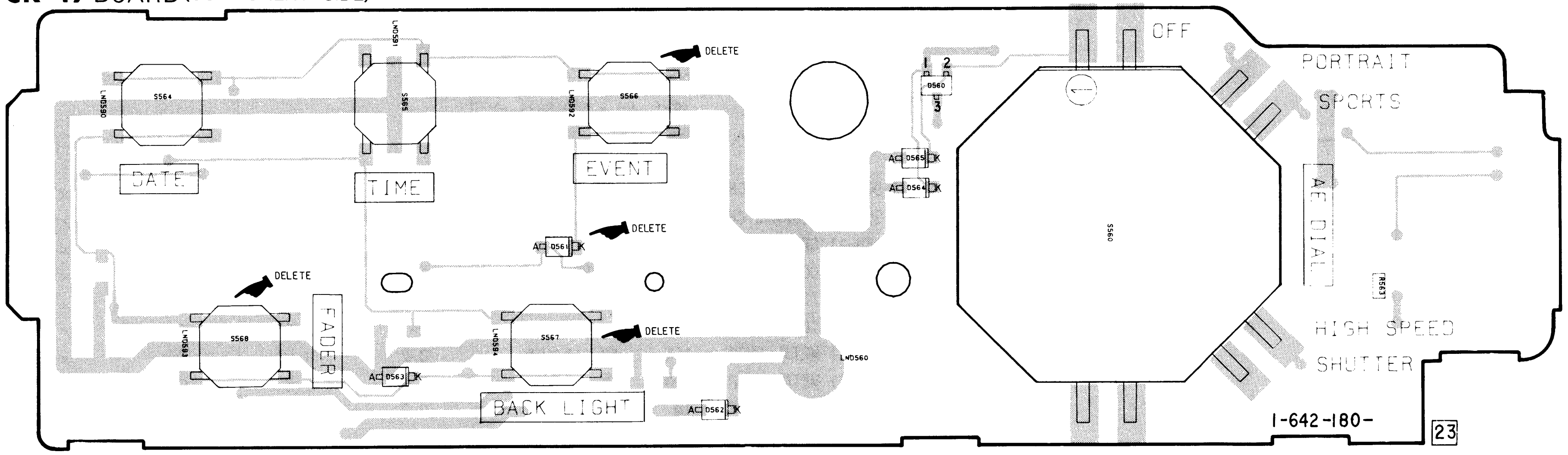
- **1 Batería NP-55 (1)**
- **2 Adaptador de alimentación de CA AC-V25 (1)**
- **3 Pila de litio CR2025 (1)**
- **4 Adaptador de RF RFU-89EA con destornillador (1)**
- **5 Tapa del: objetivo (1) (fijada a la videocámara)**
- **6 Tapa de las tomas (1) (fijada a la videocámara)**

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS/ELECTRICAL PARTS LIST

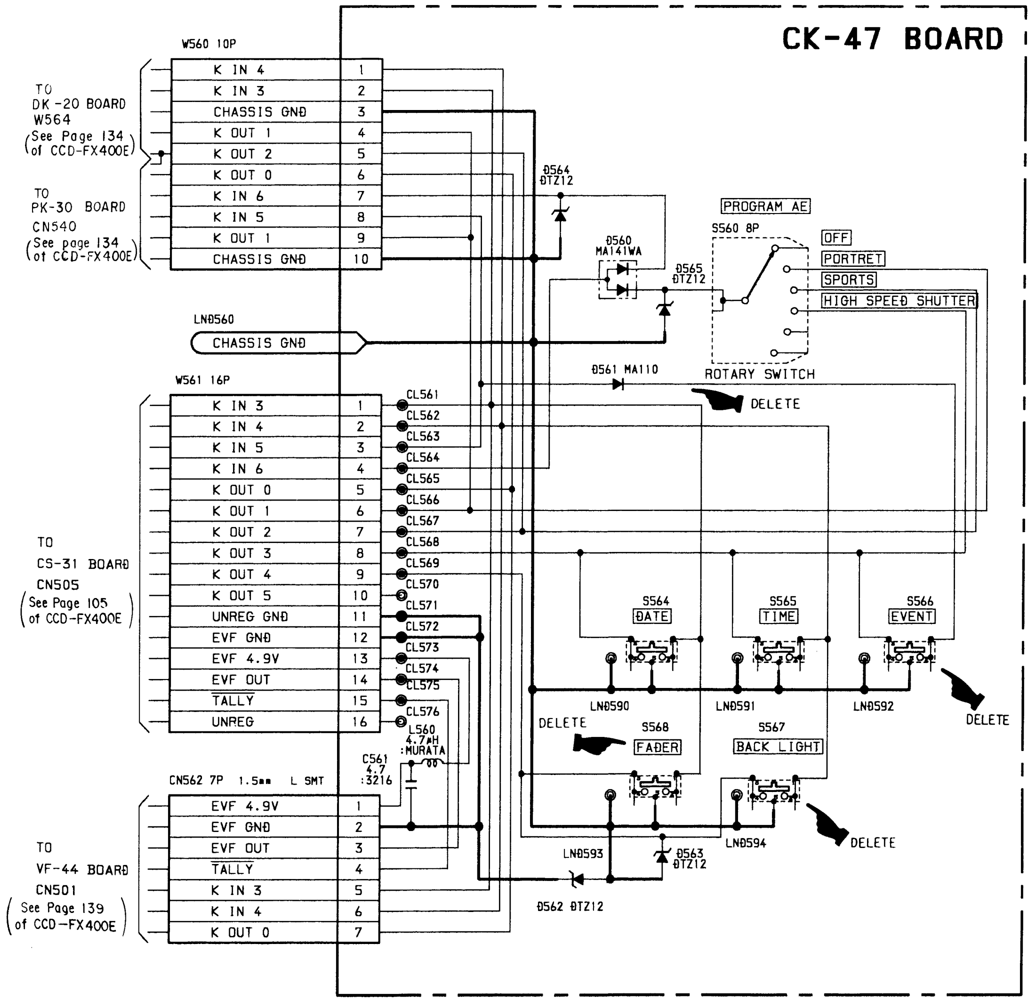
☛ : Changed Portion

Page. 129

CK-47 BOARD (COMPONENT SIDE)


DATE
TIME
EVENT
FADER
BACK LIGHT
DELETE
S564
S565
S566
S567
S568
S560
D561
D562
D563
D564
D565
LND560
OFF
PORTRAIT
SPORTS
AE DIAL
HIGH SPEED
SHUTTER
1-642-180-
23

Page. 135


CK-47 BOARD
W560 10P
K IN 4
K IN 3
CHASSIS GND
K OUT 1
K OUT 2
K OUT 0
K IN 6
K IN 5
K OUT 1
CHASSIS GND
TO DK-20 BOARD W564 (See Page 134 of CCD-FX400E)
TO PK-30 BOARD CN540 (See page 134 of CCD-FX400E)
LND560
CHASSIS GND
W561 16P
K IN 3
K IN 4
K IN 5
K IN 6
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
UNREG GND
EVF GND
EVF 4.9V
EVF OUT
TALLY
UNREG
TO CS-31 BOARD CN505 (See Page 105 of CCD-FX400E)
CN562 7P 1.5mm L SMT
EVF 4.9V
EVF GND
EVF OUT
TALLY
K IN 3
K IN 4
K OUT 0
TO VF-44 BOARD CN501 (See Page 139 of CCD-FX400E)
D564 DTZ12
D560 MA141WA
D565 DTZ12
PROGRAM AE
S560 8P
OFF
PORTRET
SPORTS
HIGH SPEED SHUTTER
ROTARY SWITCH
D561 MA110
DELETE
S564 DATE
S565 TIME
S566 EVENT
LND590
LND591
LND592
S568 FADER
S567 BACK LIGHT
LND593
LND594
D563 DTZ12
D562 DTZ12
C561 4.7 3216
L560 4.7µH MURATA
CL561
CL562
CL563
CL564
CL565
CL566
CL567
CL568
CL569
CL570
CL571
CL572
CL573
CL574
CL575
CL576

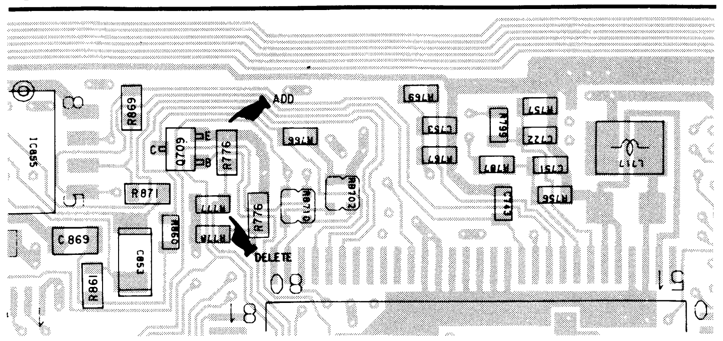
- **CK-47 BOARD**

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	Location (CCD-FX400E) SCHEMATIC	CCD-FX400E	CCD-FX200E /270E/270EP
*	A-7071-637-A	CK-47 BOARD, COMPLETE (Ref. No 6,000 Series)	—	—	○	×
*	A-7071-839-A	CK-47 BOARD, COMPLETE (Ref. No 6,000 Series)	—	—	×	○
D561	8-719-404-46	DIODE MA110	—	C-18	○	×
S566	1-572-938-21	SWITCH, TACTIL (EVENT)	—	D-19	○	×
S567	1-692-111-11	SWITCH, KEY (BACK LIGHT)	—	E-19	○	×
S568	1-692-111-11	SWITCH, KEY (FADER)	—	E-18	○	×

○ : MOUNT
× : NO MOUNT

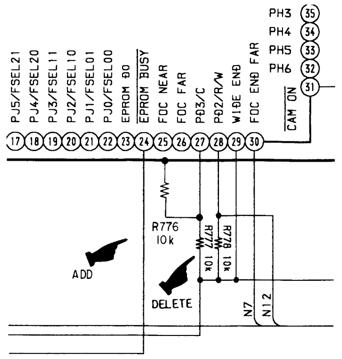
Page. 88, 89

CS-31 BOARD (COMPONENT SIDE)


ADD
DELETE
R869
Q709
R776
R871
C869
R861
C855
08
18
15

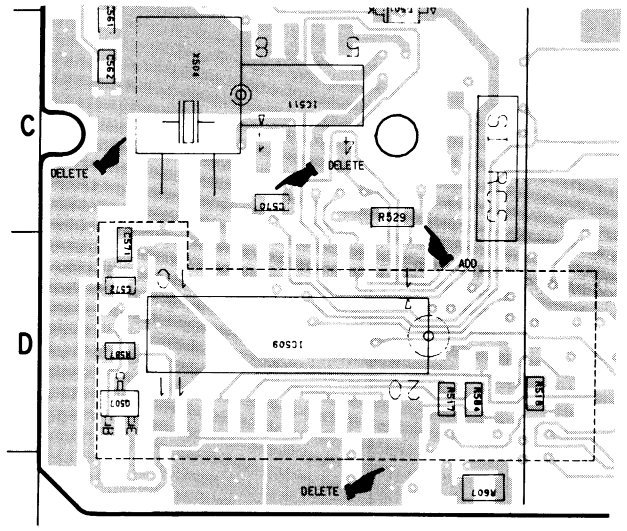
Page. 96

CS-31 BOARD (2/5)


PH3 35
PH4 34
PH5 33
PH6 32
CAM ON 31
PJ5/FSEL21
PJ4/FSEL20
PJ3/FSEL11
PJ2/FSEL10
PJ1/FSEL01
PJ0/FSEL00
EPROM DO
EPROM BUSY
FOC NEAR
FOC FAR
PD3/C
PD2/R/W
WIDE END
FOC END FAR
R776 10k
R777 10k
R778 10k
ADD
DELETE
N7
N12

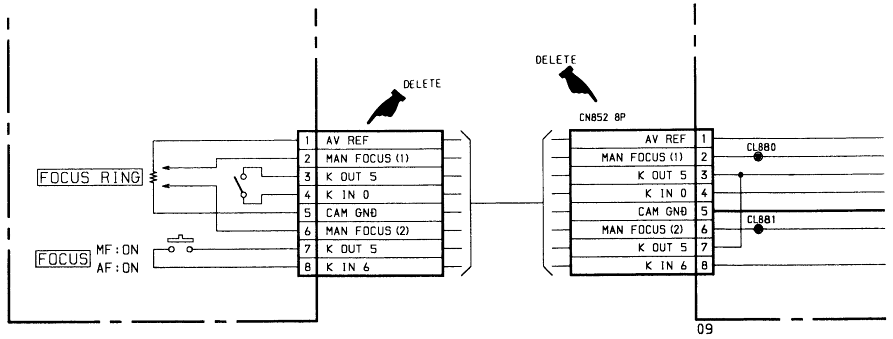
Page. 87

CS-31 BOARD (COMPONENT SIDE)


C
D
DELETE
ADD
R529
IC509
X504
8
5
20
11

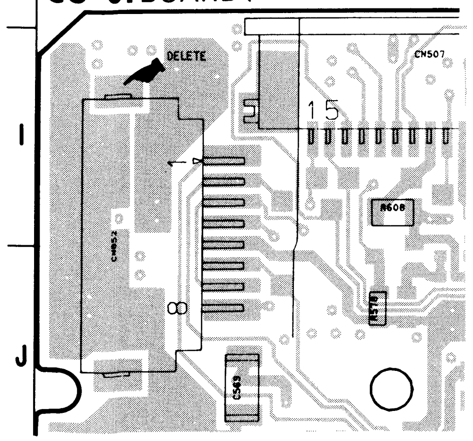
Page. 99

CS-31 BOARD (3/5)


DELETE
DELETE
FOCUS RING
FOCUS
MF : ON
AF : ON
CN852 8P
1 AV REF
2 MAN FOCUS (1)
3 K OUT 5
4 K IN 0
5 CAM GND
6 MAN FOCUS (2)
7 K OUT 5
8 K IN 6
CL880
CL881
09

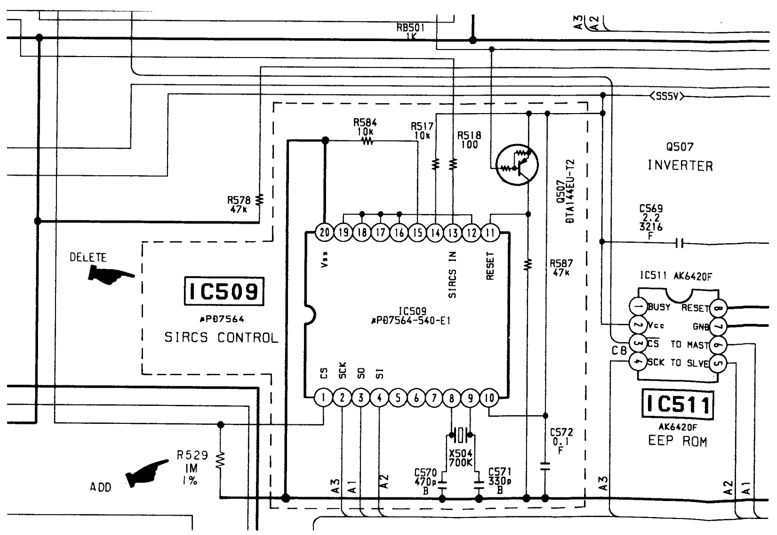
Page. 87, 88

CS-31 BOARD (CONDUCTOR SIDE)


DELETE
CN507
CN852
I
J
15
8

Page. 106

CS-31 BOARD (5/5)


RB501 1K
A3
A2
<SS5V>
R584 10k
R517 10k
R518 100
Q507 INVERTER
Q507 DTA144EU-T2
R578 47k
C569 2.2 3216 F
DELETE
IC509
μPD7564
SIRCS CONTROL
IC509 μPD7564-540-E1
Vss
SIRCS IN
RESET
CS
SCK
SO
SI
R587 47k
IC511 AK6420F
BUSY
RESET
Vcc
GND
CS
TO MAST
SCK
TO SLVE
C8
IC511
AK6420F
EEP ROM
ADD
R529 1M 1%
X504 700K
C570 470p B
C571 330p B
C572 0.1 F
A1

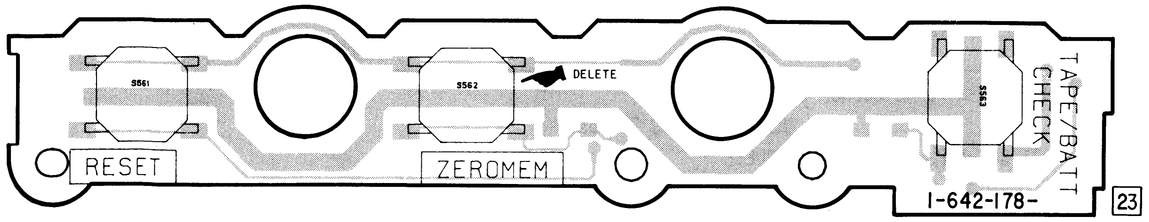
- **CS-31 BOARD**

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	Location (CCD-FX400E) SCHEMATIC	CCD-FX400E	CCD-FX200E /270E/270EP
*	A-7063-243-A	CS-31 BOARD, COMPLETE (Ref. No 3,000 Series)	—	—	○	×
*	A-7063-586-A	CS-31 BOARD, COMPLETE (Ref. No 3,000 Series)	—	—	×	○
C570	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	C-2	K-6	○	×
C571	1-162-961-11	CERAMIC CHIP 330PF 10% 50V	D-1	K-6	○	×
C572	1-164-156-11	CERAMIC CHIP 0.1uF 25V	D-1	J-7	○	×
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	I-8	I-4	○	×
IC509	8-759-145-63	IC uPD7564G-540	D-2	J-6	○	×
Q507	8-729-905-12	TRANSISTOR DTA144EU	D-1	I-6	○	×
R517	1-216-833-11	METAL CHIP 10K 5% 1/16W	D-2	I-6	○	×
R518	1-216-809-11	METAL CHIP 100 5% 1/16W	D-3	I-6	○	×
R529	1-216-543-11	METAL CHIP 1M 1% 1/10W	C-2	K-5	×	○
R584	1-216-833-11	METAL CHIP 10K 5% 1/16W	D-2	I-6	○	×
R587	1-216-841-11	METAL CHIP 47K 5% 1/16W	D-1	J-7	○	×
R776	1-216-833-11	METAL CHIP 10K 5% 1/16W	A-8	N-9	×	○
R777	1-216-833-11	METAL CHIP 10K 5% 1/16W	A-8	0-9	○	×
X504	1-579-551-11	VIBRATOR, CERAMIC (700kHz)	C-1	J-6	○	×

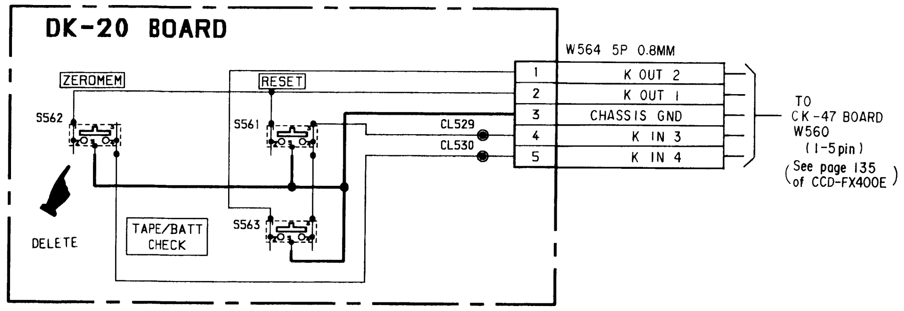
○ : MOUNT
× : NO MOUNT

Page. 131

DK-20 BOARD (COMPONENT SIDE)

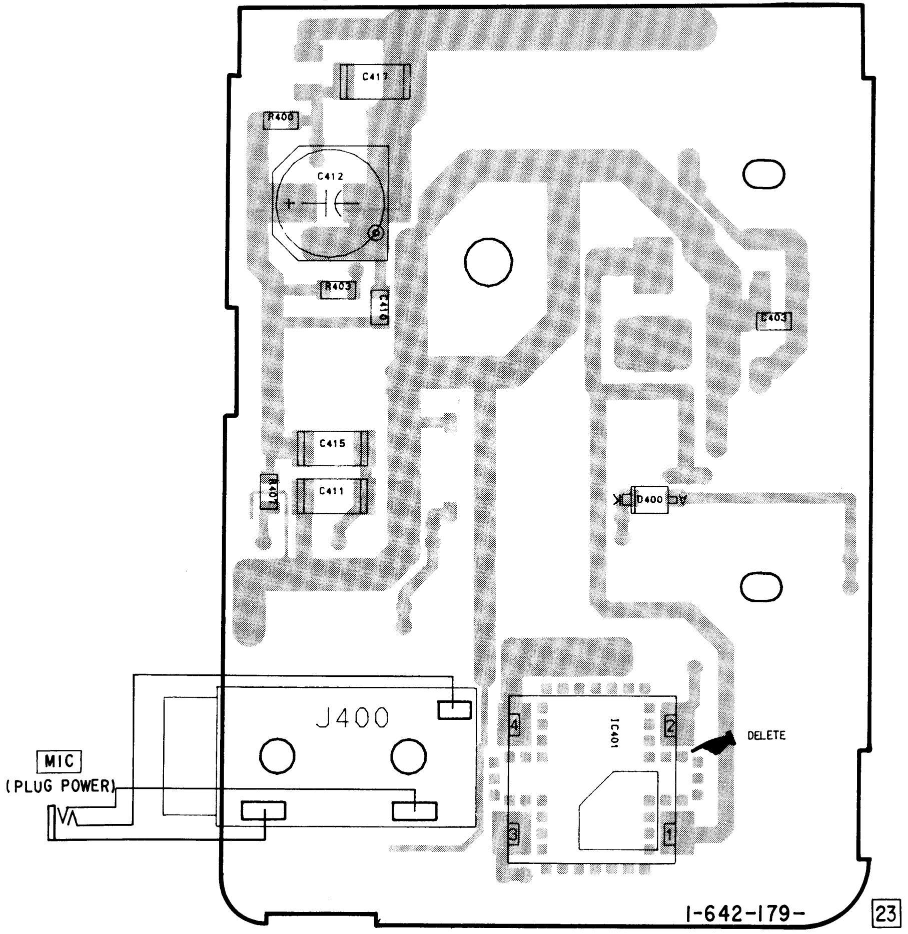

S561
S562
DELETE
S563
TAPE/BATT CHECK
RESET
ZEROMEM
1-642-178-
23

Page. 134


DK-20 BOARD
ZEROMEM
RESET
S562
S561
S563
DELETE
TAPE/BATT CHECK
CL529
CL530
W564 5P 0.8MM
1 K OUT 2
2 K OUT 1
3 CHASSIS GND
4 K IN 3
5 K IN 4
TO CK-47 BOARD W560 (1-5pin)
(See page 135 of CCD-FX400E)

Page. 131

MA-93 BOARD (COMPONENT SIDE)


C417
R400
C412
R403
C403
C415
C411
D400
J400
MIC
(PLUG POWER)
IC401
DELETE
1-642-179-
23

- DK-20 BOARD

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	Location (CCD-FX400E) SCHEMATIC	CCD-FX400E	CCD-FX200E /270E/270EP
*	A-7071-638-A	DK-20 BOARD, COMPLETE (Ref. No 7,000 Series)	—	—	○	×
*	A-7071-840-A	DK-20 BOARD, COMPLETE (Ref. No 7,000 Series)	—	—	×	○
S562	1-572-938-21	SWITCH, TACTIL (ZEROMEM)	—	A-9	○	×

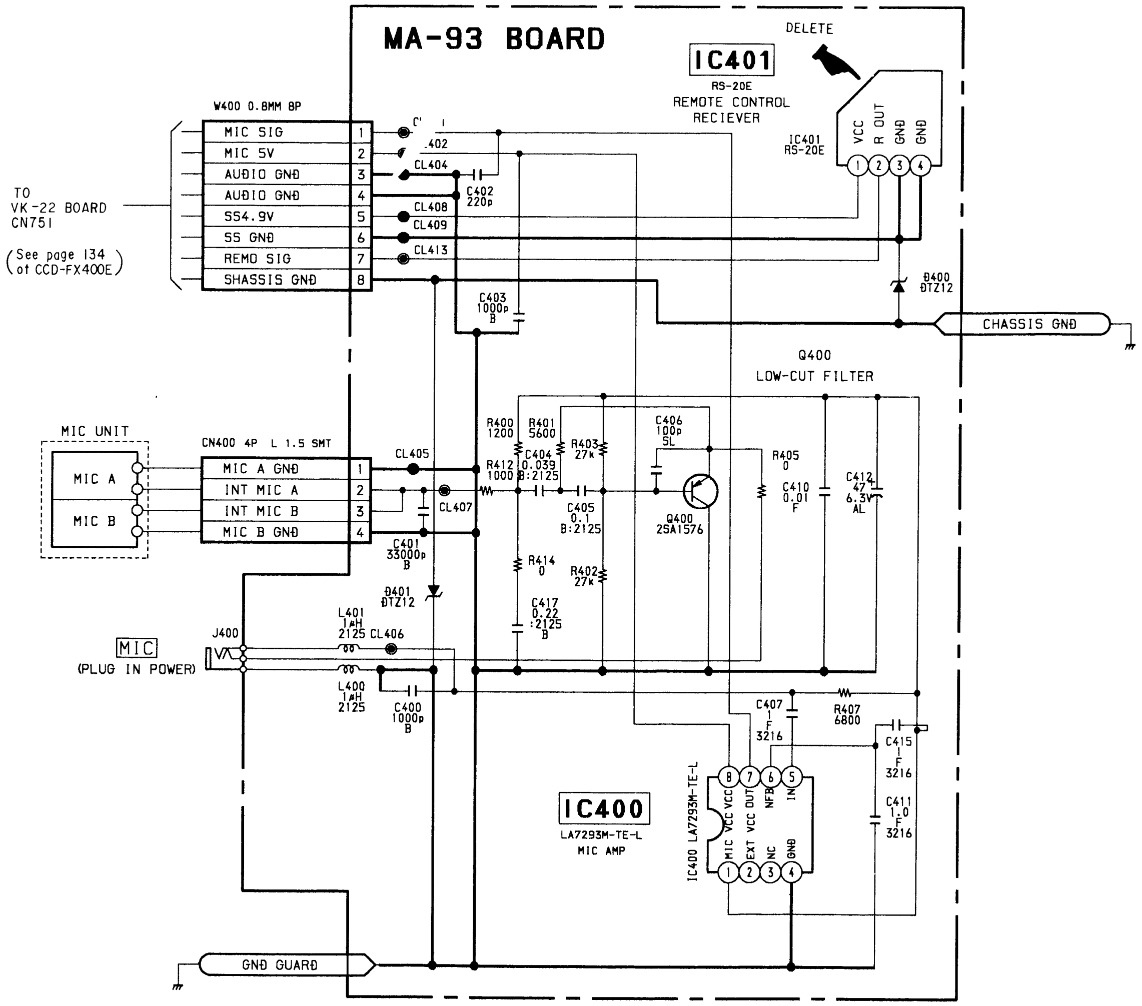
○ :MOUNT
× :NO MOUNT

- MA-93 BOARD

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	Location (CCD-FX400E) SCHEMATIC	CCD-FX400E	CCD-FX200E /270E/270EP
*	A-7063-246-A	MA-93 BOARD, COMPLETE (Ref. No 3,000 Series)	—	—	○	×
*	A-7063-589-A	MA-93 BOARD, COMPLETE (Ref. No 3,000 Series)	—	—	×	○
IC401	8-719-110-03	IC RS-20E-T	—	B-6	○	×

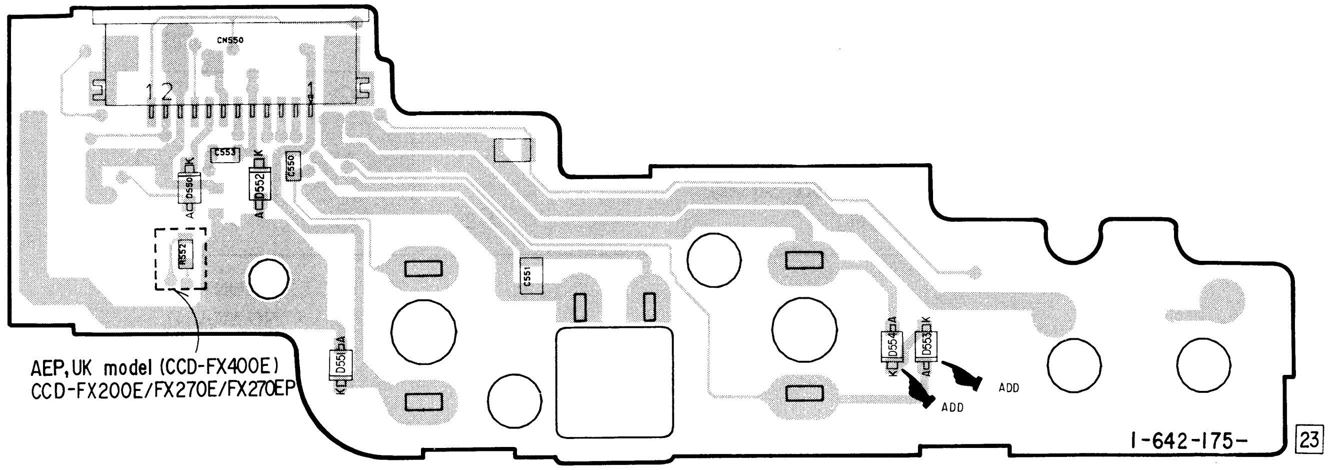
○ :MOUNT
× :NO MOUNT

Page. 133

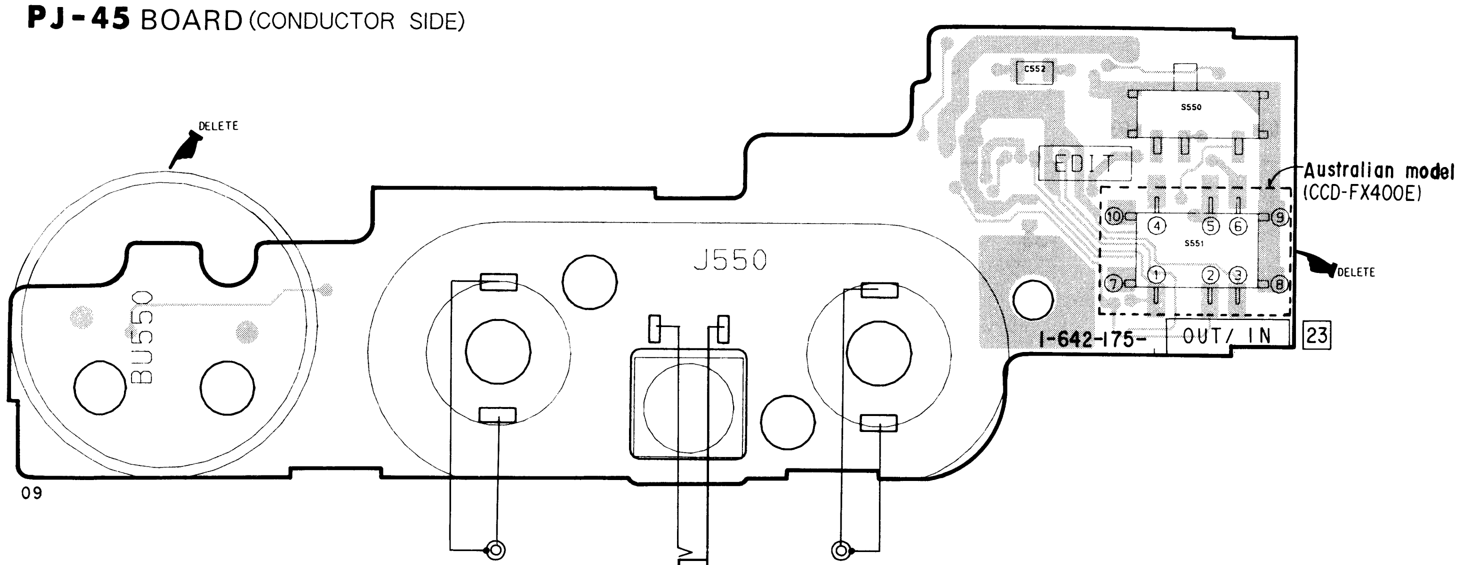

MA-93 BOARD
IC401
RS-20E
REMOTE CONTROL RECIEVER
DELETE
VCC
R OUT
GND
GND
W400 0.8MM 8P
1 MIC SIG
2 MIC 5V
3 AUDIO GND
4 AUDIO GND
5 SS4.9V
6 SS GND
7 REMO SIG
8 SHASSIS GND
TO VK-22 BOARD CN751
(See page 134 of CCD-FX400E)
CL404
CL408
CL409
CL413
C402 220p
C403 1000p B
D400 DTZ12
CHASSIS GND
Q400 LOW-CUT FILTER
MIC UNIT
MIC A
MIC B
CN400 4P L 1.5 SMT
1 MIC A GND
2 INT MIC A
3 INT MIC B
4 MIC B GND
CL405
CL407
R400 1200
R401 5600
R412 1000
C404 0.039 B:2125
R403 27k
C406 100p SL
C405 0.1 B:2125
Q400 2SA1576
R405 0
C410 0.01 F
C412 47 6.3V AL
C401 33000p B
R414 0
R402 27k
D401 DTZ12
C417 0.22 :2125 B
L401 1uH 2125
CL406
J400
MIC
(PLUG IN POWER)
L400 1uH 2125
C400 1000p B
C407 1 F 3216
R407 6800
C415 1 F 3216
C411 1.0 F 3216
IC400 LA7293M-TE-L
IC400
LA7293M-TE-L
MIC AMP
MIC
EXT VCC
NC
GND
IN
NFB
OUT
VCC
GND GUARD

Page. 129

PJ-45 BOARD (COMPONENT SIDE)


CN550
12
1
AEP,UK model (CCD-FX400E)
CCD-FX200E/FX270E/FX270EP
ADD
ADD
1-642-175-
23

PJ-45 BOARD (CONDUCTOR SIDE)


DELETE
EDIT
S550
Australian model
(CCD-FX400E)
S551
DELETE
J550
BU550
1-642-175-
OUT/ IN
23
09

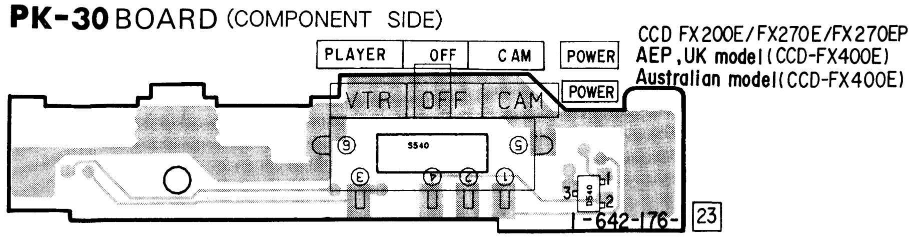
(CCD-FX400E) Australian model VIDEO IN/OUT
(CCD-FX400E) AEP,UK model VIDEO
(CCD-FX200E/FX270E/FX270EP)

RFU DC OUT

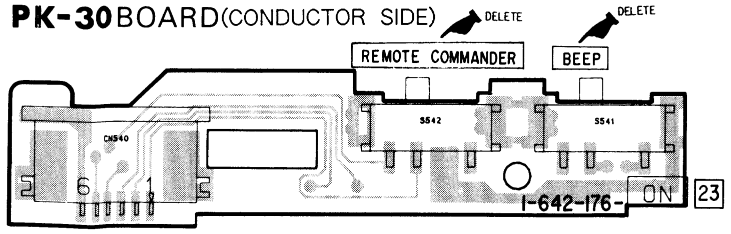
AUDIO IN/OUT Australian model (CCD-FX400E)
AUDIO AEP,UK model (CCD-FX400E)
(CCD-FX200E/FX270E/FX270EP)

Page. 132

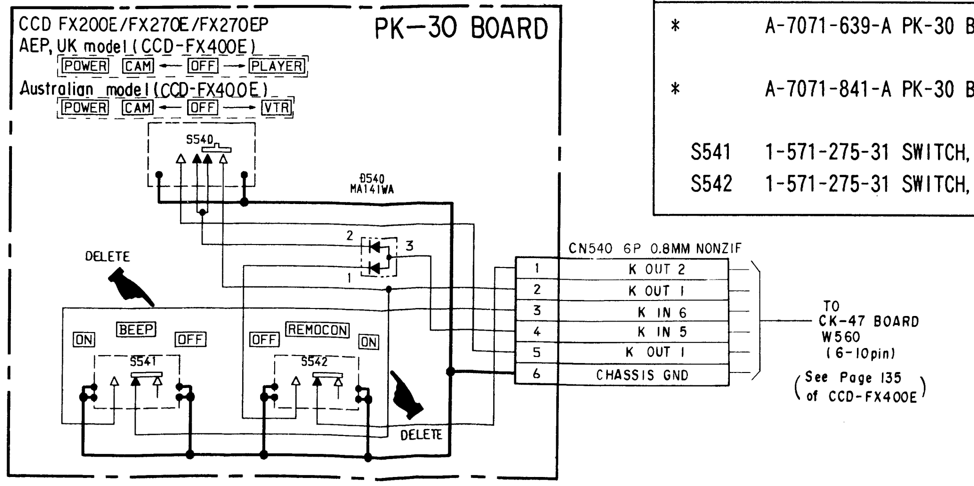
PK-30 BOARD (COMPONENT SIDE)


PLAYER OFF CAM POWER CCD FX200E/FX270E/FX270EP
VTR OFF CAM POWER AEP,UK model (CCD-FX400E)
Australian model (CCD-FX400E)
S540
1-642-176-
23

PK-30 BOARD (CONDUCTOR SIDE)


DELETE
DELETE
REMOTE COMMANDER
BEEP
CN540
S542
S541
6
1
1-642-176-
ON
23

Page. 134

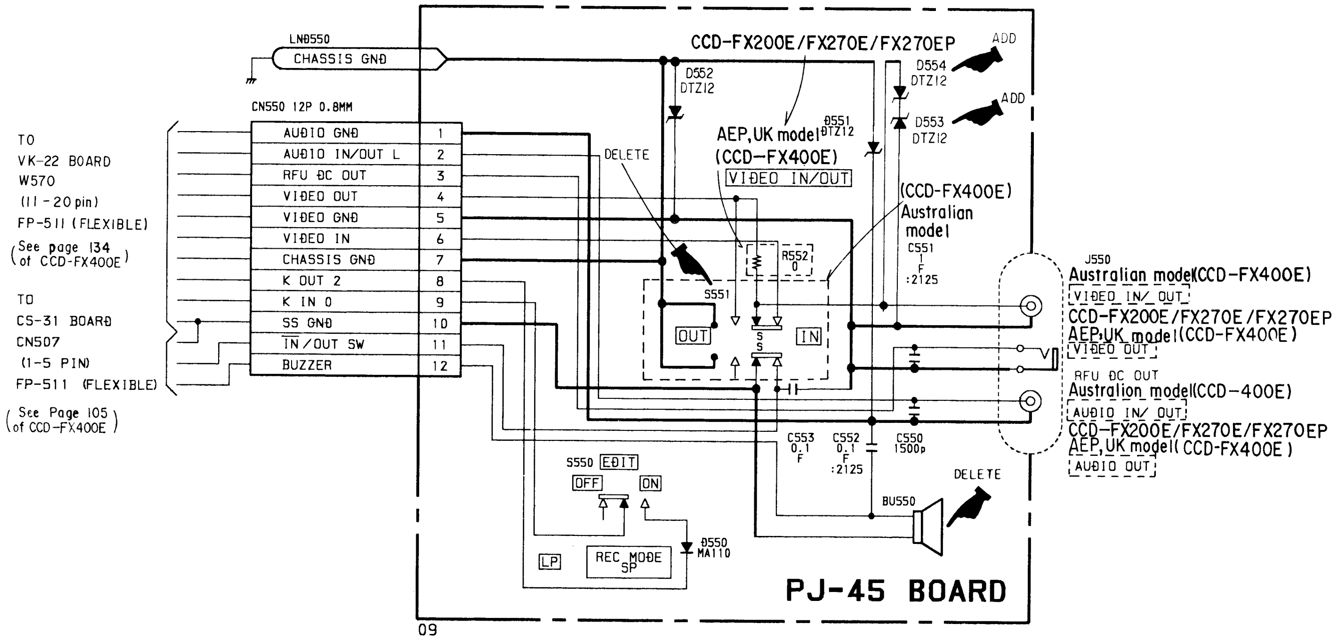

CCD FX200E/FX270E/FX270EP
AEP,UK model (CCD-FX400E)
POWER CAM OFF PLAYER
Australian model (CCD-FX400E)
POWER CAM OFF VTR
PK-30 BOARD
S540
D540 MA141WA
DELETE
BEEP ON OFF S541
REMOCON OFF ON S542
DELETE
CN540 6P 0.8MM NONZIF
1 K OUT 2
2 K OUT 1
3 K IN 6
4 K IN 5
5 K OUT 1
6 CHASSIS GND
TO CK-47 BOARD W560 (6-10pin)
(See Page 135 of CCD-FX400E)

- **PJ-45 BOARD**

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	Location (CCD-FX400E) SCHEMATIC	CCD-FX400E	CCD-FX200E/270E/270EP
*	A-7071-634-A	PJ-45 BOARD, COMPLETE (Ref. No 9,000 Series)	—	—	○	×
*	A-7071-838-A	PJ-45 BOARD, COMPLETE (Ref. No 9,000 Series)	—	—	×	○
BU550	1-529-107-11	BUZZER, PIEZOELECTRIC	—	J-6	○	×
D553	8-719-110-03	DIODE RD7.5ES-B2	—	H-6	×	○
D554	8-719-110-03	DIODE RD7.5ES-B2	—	H-6	×	○
S551	1-571-674-11	SWITCH, SLIDE (VIDEO IN/OUT) (AUS)	—	I-5	○	×

○:MOUNT
×:NO MOUNT

Page. 133


LN0550
CHASSIS GND
CN550 12P 0.8MM
1 AUDIO GND
2 AUDIO IN/OUT L
3 RFU DC OUT
4 VIDEO OUT
5 VIDEO GND
6 VIDEO IN
7 CHASSIS GND
8 K OUT 2
9 K IN 0
10 SS GND
11 IN/OUT SW
12 BUZZER
TO VK-22 BOARD W570 (11-20pin) FP-511 (FLEXIBLE)
(See page 134 of CCD-FX400E)
TO CS-31 BOARD CN507 (1-5 PIN) FP-511 (FLEXIBLE)
(See Page 105 of CCD-FX400E)
CCD-FX200E/FX270E/FX270EP
ADD
D552 DTZ12
D554 DTZ12
D553 DTZ12
ADD
DELETE
D551 DTZ12
AEP,UK model (CCD-FX400E)
VIDEO IN/OUT
(CCD-FX400E) Australian model
C551 :2125
R552 0
S551
OUT IN
J550
Australian model (CCD-FX400E)
VIDEO IN/OUT
CCD-FX200E/FX270E/FX270EP
AEP,UK model (CCD-FX400E)
VIDEO OUT
RFU DC OUT
Australian model (CCD-400E)
AUDIO IN/OUT
CCD-FX200E/FX270E/FX270EP
AEP,UK model (CCD-FX400E)
AUDIO OUT
C553 0.1 F
C552 0.1 F :2125
C550 1500p
DELETE
BU550
S550 EDIT
OFF ON
D550 MA110
LP REC MODE SP
PJ-45 BOARD
09

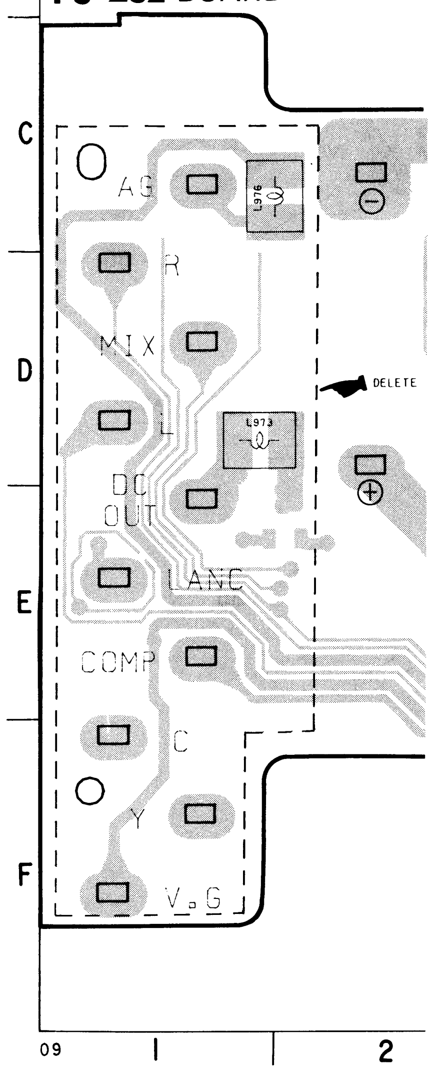
- **PK-30 BOARD**

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	Location (CCD-FX400E) SCHEMATIC	CCD-FX400E	CCD-FX200E/270E/270EP
*	A-7071-639-A	PK-30 BOARD, COMPLETE (Ref. No 8,000 Series)	—	—	○	×
*	A-7071-841-A	PK-30 BOARD, COMPLETE (Ref. No 8,000 Series)	—	—	×	○
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	—	D-10	○	×
S542	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER)	—	D-11	○	×

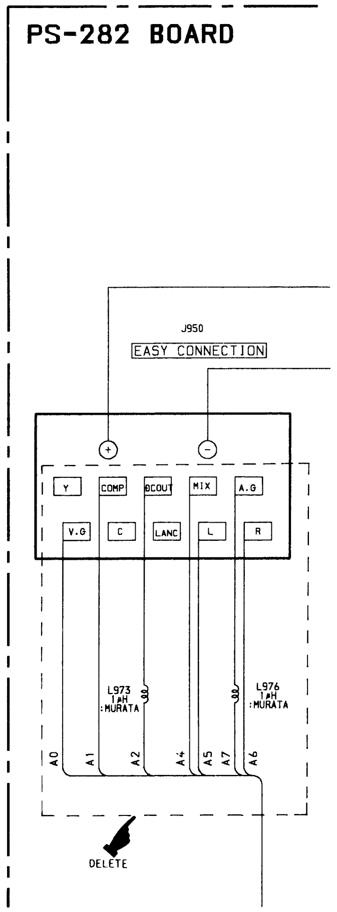
○:MOUNT
×:NO MOUNT

Page. 143

PS-282 BOARD (COMPONENT SIDE)


C
D
E
F
A.G
R
MIX
L976
L973
DC OUT
LANC
COMP
C
Y
V.G
DELETE
09
1
2

Page. 141


PS-282 BOARD
J950
EASY CONNECTION
Y
COMP
DCOUT
MIX
A.G
V.G
C
LANC
L
R
L973 1uH MURATA
L976 1uH MURATA
A0
A1
A2
A4
A5
A7
A6
DELETE

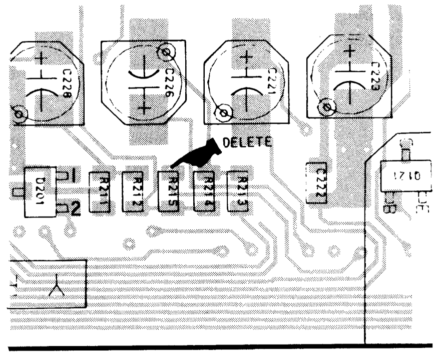
- **PS-282 BOARD**

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	SCHEMATIC	CCD-FX400E	CCD-FX200E /270E/270EP
*	A-7063-242-A	PS-282 BOARD, COMPLETE (Ref. No 3,000 Series)	—	—	○	×
*	A-7063-588-A	PS-282 BOARD, COMPLETE (Ref. No 3,000 Series)	—	—	×	○
J950	1-537-281-31	TERMINAL BOARD (EASY CONNECTOR)			○	×
J950	1-537-281-41	TERMINAL BOARD (EASY CONNECTOR)			×	○
L973	1-412-026-11	INDUCTOR CHIP 1uH	D-1		○	×
L976	1-412-026-11	INDUCTOR CHIP 1uH	C-1		○	×

○:MOUNT
×:NO MOUNT

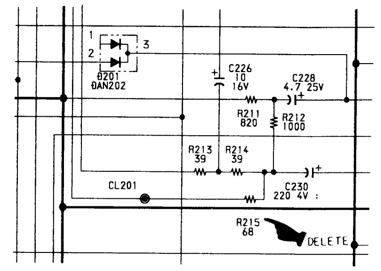
Page. 111

VA-71 BOARD (COMPONENT SIDE)


C228
C226
C227
C223
DELETE
D201
R211
R212
R215
R214
R213
C222
2

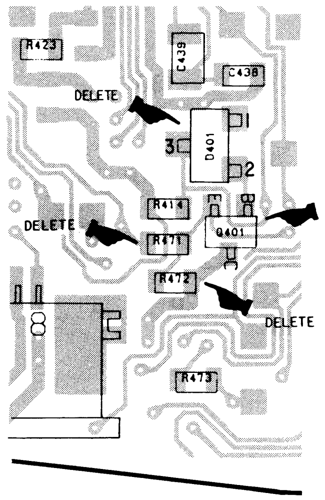
Page. 114

VA-71 BOARD (1/3)


D201 DAN202
C226 10 16V
C228 4.7 25V
R211 820
R212 1000
R213 39
R214 39
C230 220 4V
CL201
R215 68
DELETE

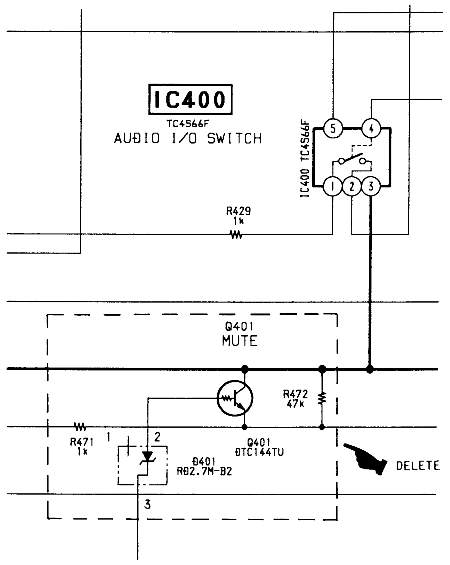
Page. 110

VA-71 BOARD (CONDUCTOR SIDE)


R423
C439
C438
DELETE
D401
R414
R471
Q401
R472
R473
DELETE
DELETE
DELETE

Page. 122

VA-71 BOARD (3/3)


IC400
TC4566F
AUDIO I/O SWITCH
IC400 TC4566F
R429 1k
Q401 MUTE
R472 47k
R471 1k
Q401 DTC144TU
D401 RD2.7M-B2
DELETE

- **VA-71 BOARD**

Ref. No.	Part No.	Description	Location (CCD-FX400E) PRINTED	SCHEMATIC	CCD-FX400E	CCD-FX200E /270E/270EP
*	A-7063-244-A	VA-71 BOARD, COMPLETE (AEP, UK) (Ref. No 2,000 Series)	—	—	○	×
*	A-7063-295-A	VA-71 BOARD, COMPLETE (AUS) (Ref. No 2,000 Series)	—	—	○	×
*	A-7063-587-A	VA-71 BOARD, COMPLETE (Ref. No 2,000 Series)	–	–	×	○
D401	8-719-105-32	DIODE RD2.7M-B2	I-5	F-9	○	×
Q401	8-729-921-08	TRANSISTOR DTC144TV	I-5	F-9	○	×
R215	1-216-807-11	METAL CHIP 68 5% 1/16W	E-12	D-11	○	×
R471	1-216-821-11	METAL CHIP 1K 5% 1/16W	I-5	F-8	○	×
R472	1-216-841-11	METAL CHIP 47K 5% 1/16W	J-5	F-9	○	×

○:MOUNT
×:NO MOUNT

- Other boards are the same as those of CCD-FX400E.

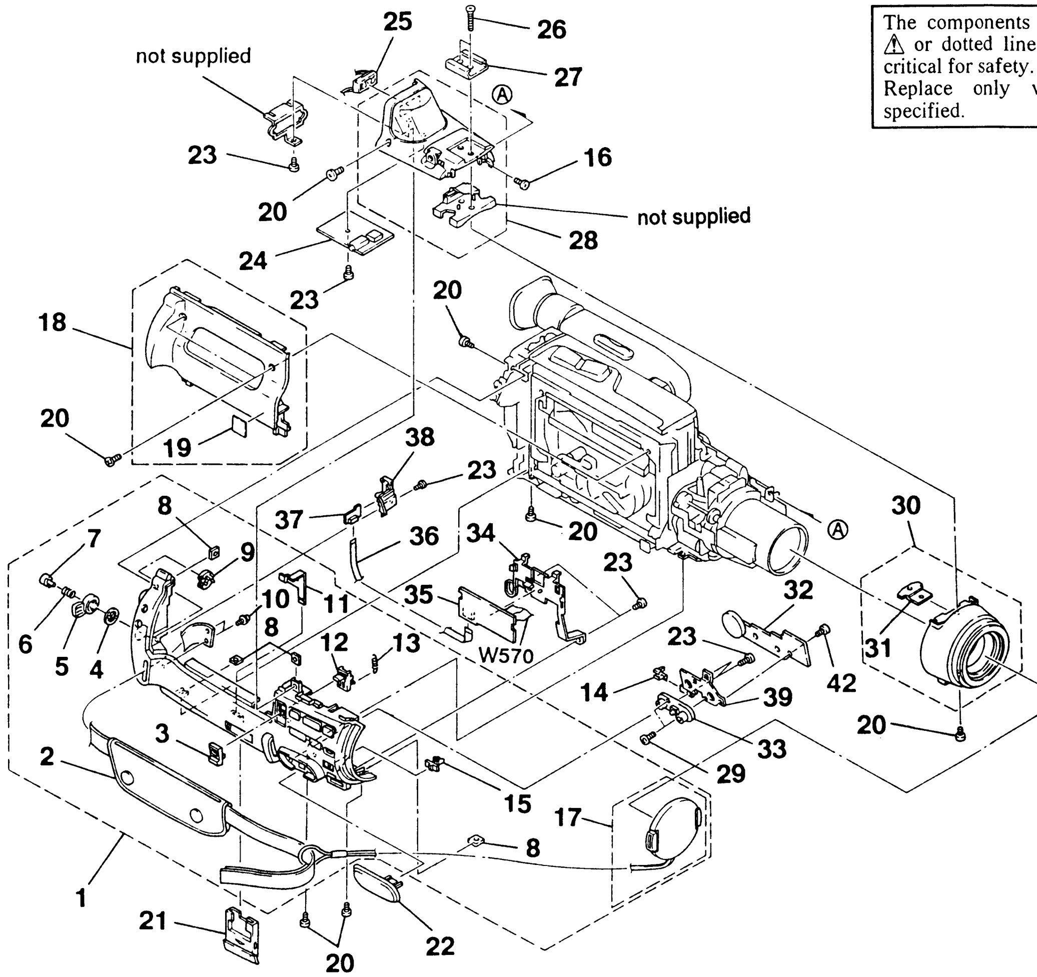
SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

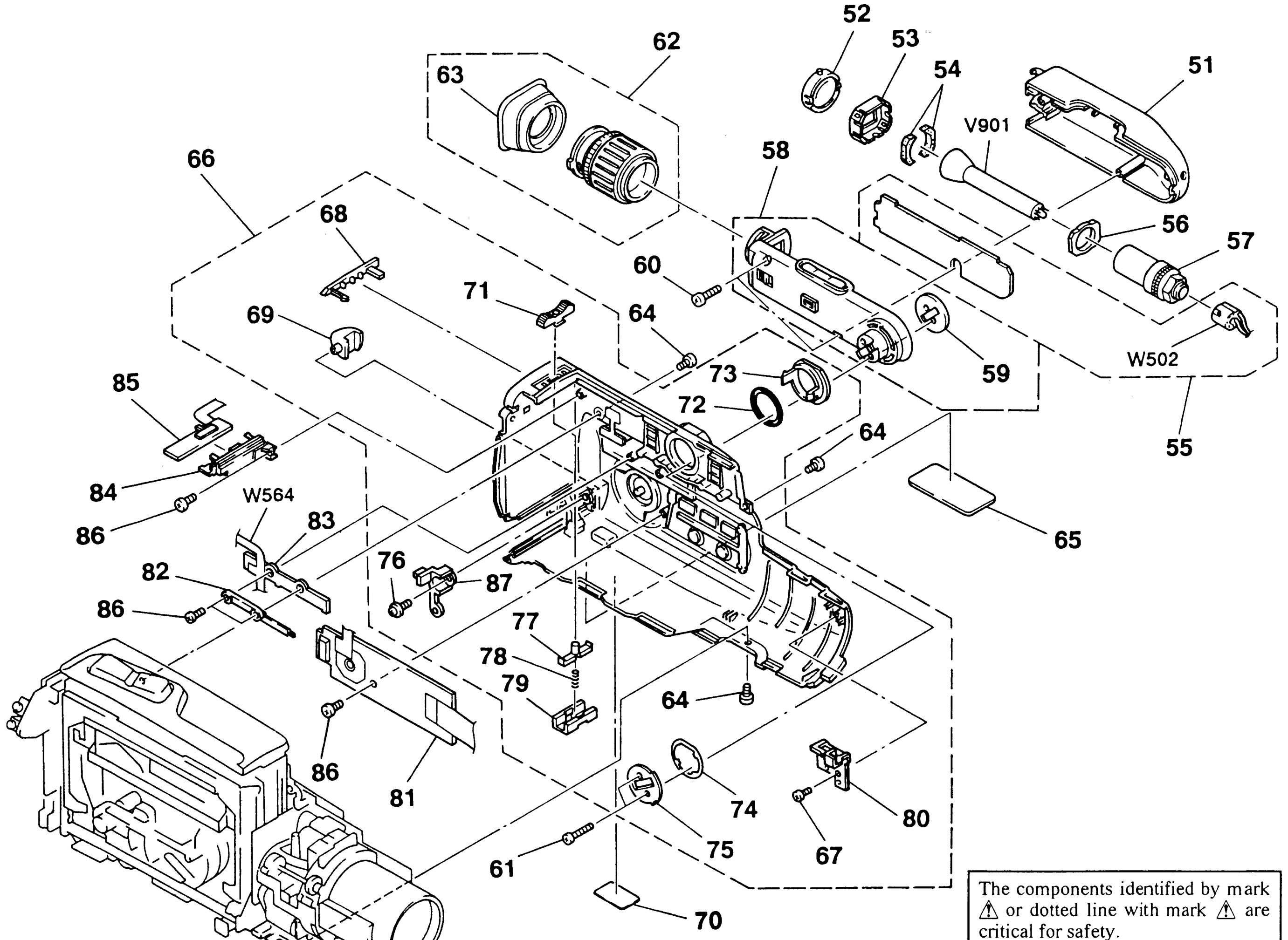
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (UPPER), (L) ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3942-875-1	CABINET (L) ASSY	
2	3-736-807-01	BELT, GRIP	
3	3-946-195-01	BUTTON, EJECT	
4	3-736-364-01	SPRING	
5	3-942-985-01	KNOB, STAND-BY	
6	3-578-221-00	SPRING, COMPRESSION	
7	3-736-343-01	BUTTON, S/S	
8	3-718-233-01	NUT, PLATE	
9	3-946-260-01	HOLDER, STAND-BY KNOB	
10	3-669-480-21	+ PTPWH 2	
11	1-550-743-11	HOLDER, BATTERY	
12	3-946-194-01	LOCK, EJECT	
13	3-570-896-00	SPRING, TENSION	
14	3-947-487-01	PLATE, GROUND, PJ	
15	3-946-187-01	BUTTON, EDIT	
16	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
17	A-7091-810-A	CAP BLOCK ASSY, LENS	
18	X-3942-862-1	LID ASSY, CASSETTE (FX270E/FX270EP)	
18	X-3942-938-1	LID ASSY, CASSETTE (FX200E)	
* 19	3-703-713-41	STICKER, SONY SYMBOL (10)	
20	3-719-381-01	SCREW (M2X4)	
21	X-3941-664-1	HOLDER ASSY, LITHIUM	
22	3-946-169-11	LID, JACK	
23	3-948-339-01	SCREW (BTP) (2X5), HEAD	
24	A-7063-589-A	MA-93P (SL) BOARD, COMPLETE	
25	1-542-126-41	MICROPHONE UNIT	
26	3-948-809-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3942-873-1	CABINET (UPPER) ASSY	
29	3-724-455-01	SCREW (M2X4)	
30	X-3942-874-1	CABINET (FRONT) ASSY (FX270E/FX270EP)	
30	X-3942-937-1	CABINET (FRONT) ASSY (FX200E)	
31	3-946-172-01	SHEET METAL, SHOE	
32	A-7071-838-A	PJ-45P (SL) BOARD, COMPLETE	
33	1-537-402-11	TERMINAL BOARD	
34	3-946-259-01	HOLDER, VK	
35	A-7071-632-A	VK-22P BOARD, COMPLETE	
36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
37	A-7071-633-A	SW-200P BOARD, COMPLETE	
38	3-946-185-01	HOLDER, SW	
* 39	3-946-225-01	REINFORCEMENT, PJ	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	

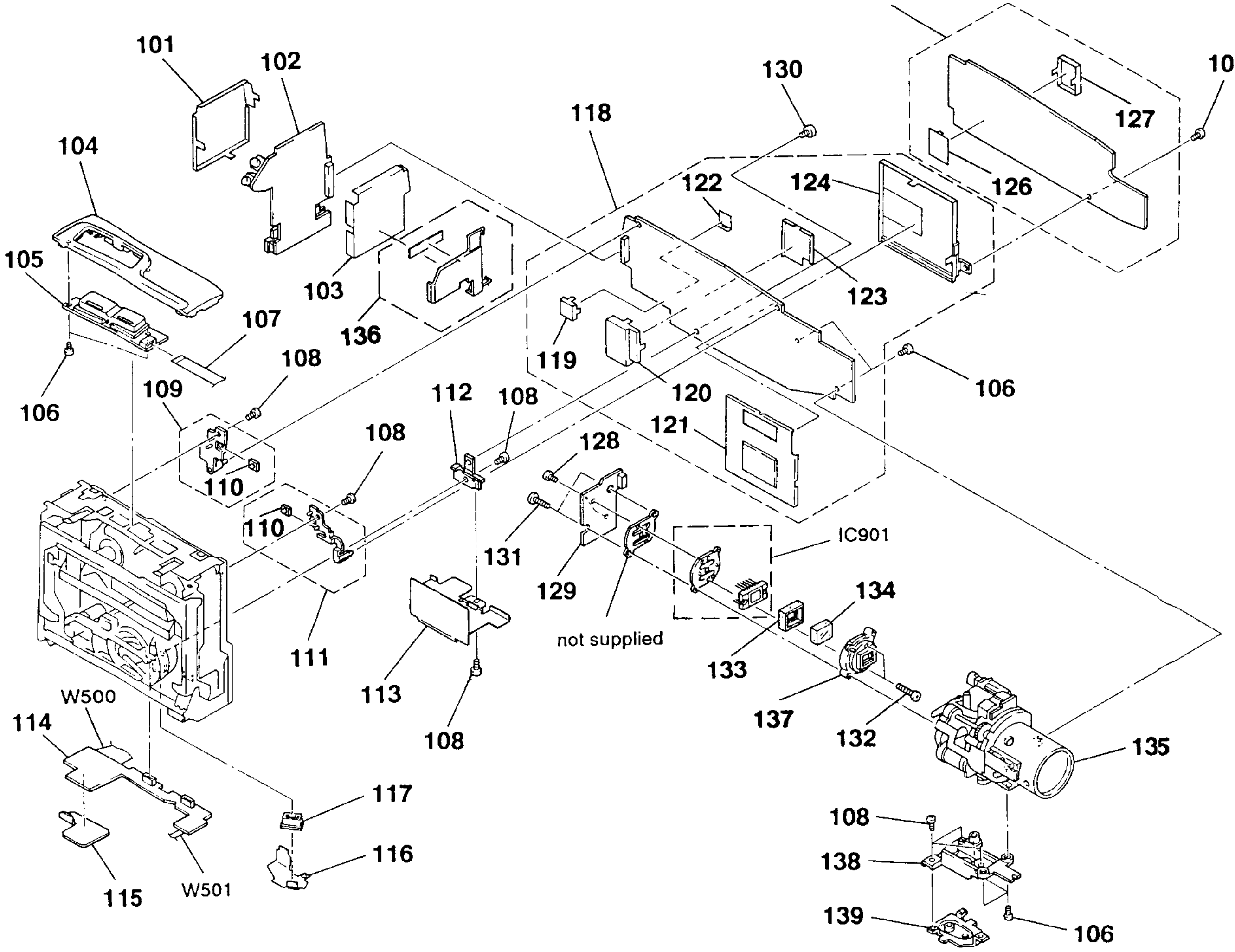
5-2. CABINET (R), EVF ASSEMBLIES



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	X-3941-670-1	CABINET (R) ASSY, EVF	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	A-7063-129-A	VF-44P BOARD, COMPLETE	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	X-3941-669-1	CABINET (L) ASSY, EVF	
59	3-946-202-01	JOINT, EVF	
60	3-713-790-31	SCREW (M2X8), TAPPING, P3	
61	3-740-546-51	SCREW (M2X9)	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-953-719-01	LABEL, MODEL NUMBER (FX270E/FX270EP)	
* 65	3-953-929-01	LABEL, MODEL NUMBER (FX200E:AEP)	
* 65	3-954-295-01	LABEL, MODEL NUMBER (FX200E:UK)	
66	X-3942-861-1	CABINET (R) ASSY	
67	3-713-790-01	SCREW (M2X5), TAPPING, P3	
68	3-946-256-11	CAP, POWER	
69	3-946-246-11	BUTTON, BATTERY RELEASE	
* 70	3-704-235-01	LABEL, CAUTION (FX200E:UK)	
71	3-946-248-01	BUTTON, POWER	
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	
74	3-946-255-01	SPRING, LEAF, TILT	
75	3-946-254-01	PLATE, LOCK, TILT	
76	3-669-480-21	+ PTPWH 2	
77	3-946-186-01	PUSH BUTTON, POWER	
78	3-303-973-00	SPRING, COMPRESSION	
79	3-946-249-01	PLATE, FUNCTION, POWER	
80	3-947-315-01	PLATE, FIXED, CABINET	
81	A-7071-839-A	CK-47P (SL) BOARD, COMPLETE	
82	3-946-199-01	RETAINER, DK	
83	A-7071-840-A	DK-20P (SL) BOARD, COMPLETE	
84	3-946-198-01	RETAINER, PK	
85	A-7071-841-A	PK-30P (SL) BOARD, COMPLETE	
86	3-948-339-01	SCREW (BTP) (2X5), HEAD	
87	3-946-250-01	CLAW, BATTERY LOCK	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
⚠W502	1-452-565-11	CRT ASSY	
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

5-3. MAIN BOARD ASSEMBLY


101
102
104
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107
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103
136
118
122
124
125
130
108
127
126
123
119
120
121
106
112
108
108
128
131
129
not supplied
IC901
134
133
111
113
108
W500
114
137
132
135
117
116
115
W501
108
138
139
106

Ref. No.	Part No.	Description	Remark
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-588-A	PS-282P (SL) BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-668-1	LID ASSY, LS	
105	1-692-257-21	SWITCH, PUSH (ZOOM)	
106	3-948-339-01	SCREW (BTP) (2X5), HEAD	
107	1-643-555-11	FP-558 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
109	A-7081-889-A	HOLDER (R) ASSY, CS	
110	3-718-233-01	NUT, PLATE	
111	A-7081-888-A	HOLDER (F) ASSY, CS	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-245-A	SL-22P BOARD, COMPLETE	
* 115	3-947-660-01	INSULATOR, SL	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-586-A	CS-31P (SL) BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-948-499-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 122	3-946-180-01	CASE (LID), SHIELD, FE	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-587-A	VA-71P (SL) BOARD, COMPLETE	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-713-786-51	SCREW (M2X3)	
129	A-7063-241-A	CD-61P BOARD, COMPLETE	
130	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
131	3-747-151-21	SCREW (2X12)	
132	3-713-786-11	SCREW (M2X6)	
133	3-943-063-02	RUBBER, SEAL	
134	1-547-558-21	FILTER BLOCK, OPTICAL	
135	1-547-540-11	LENS, ZOOM (VCL-6110WA) (TYPE I)	
135	1-547-561-21	LENS, ZOOM (VCL-6110WC) (TYPE II)	
* 136	X-3942-278-1	STOPPER ASSY, PS	
137	3-949-334-01	ADAPTOR (S), CCD FITTING	
138	3-946-223-01	HOLDER (C), LENS	
139	3-946-224-01	SHEET METAL, TRIPOD	
IC901	A-7030-436-A	CCD BLOCK ASSY(ICX045AKA-2)(CCD IMAGER)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS *******************************	
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE) (FX200E:UK)	
	3-712-673-01	SCREWDRIVER (FX200E:UK)	
	3-756-737-51	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (FX270E:E/FX270EP)	
	3-756-737-61	MANUAL, INSTRUCTION (FRENCH, GERMAN) (FX270E:E/FX270EP)	
	3-756-737-71	MANUAL, INSTRUCTION (ARABIC) (FX270E:E/FX270EP)	
	3-756-737-81	MANUAL, INSTRUCTION (CHINESE) (FX270E:E/FX270EP)	
	3-756-737-91	MANUAL, INSTRUCTION (ENGLISH) (FX270E:AUS)	
	3-756-844-11	MANUAL, INSTRUCTION (ENGLISH) (FX200E)	
	3-756-844-41	MANUAL, INSTRUCTION (FRENCH, DUTCH) (FX200E:AEP)	
	3-756-844-51	MANUAL, INSTRUCTION (GERMAN, ITALIAN) (FX200E:AEP)	
	3-756-844-61	MANUAL, INSTRUCTION (SPANISH, SWEDISH) (FX200E:AEP)	
	3-756-844-71	MANUAL, INSTRUCTION (PORTUGUESE) (FX200E:AEP)	
	3-756-844-81	MANUAL, INSTRUCTION (DANISH, FINNISH) (FX200E:AEP)	
*	3-944-737-01	CUSHION (FX270EP)	
*	3-947-112-01	CUSHION (LOWER) (FX200E/FX270E)	
*	3-948-354-01	CUSHION, ACC (FX200E/FX270E)	
*	3-950-559-31	INDIVIDUAL CARTON (FX270EP)	
*	3-953-700-01	INDIVIDUAL CARTON (FX270E)	
*	3-953-700-11	INDIVIDUAL CARTON (FX200E)	
	3-954-159-01	CASE, CARRYING (FX270EP)	
	9-910-999-32	BAG, PROTECTION (FX270EP)	
	A-6767-706-A	RFU ADAPTOR (RFU-89EA)(FX270E:E/FX270EP)	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA)(FX200E:UK)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E)(FX200E:AEP)	
	A-6768-255-A	RFU ADAPTOR (RFU-90AS)(FX270E:Australian)	
**	AC-V25	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note
** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

SECTION 7
CAMERA SECTION ADJUSTMENTS

CCD-FX270E/FX270EP (E model), refer to service manual for CCD-FX300E.

☛ : Changed Portion

7-1-5. Page F Address List

CCD-FX200E (AEP, UK model)
CCD-FX270E (Australian model)

Page 180

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	ID	Set ID	00	4C
11	CORE EFECT	Special effect control	A0	A0
15	CORE CHROMA DLY	Y/C delay adjustment	06	06
16	CORE Y SETUP	Set up level setting	06	06

Page 182

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
62	AE REFH	Reference value (upper) for AE	1E	1E

Page 184

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
A5	LIMITREST TELE	Zoom limiter TELE side	5A	5A
B1	CORE YGAIN	Core field data 0 byte gain	3F	3F

CCD-FX200E only

CCD-FX270E/FX270EP (E model)

Page 178

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
15	CORE CHROMA DLY	Y/C delay adjustment	06	06
16	CORE Y SETUP	Set up level setting	06	06

Page 180

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
62	AE REFH	Reference value (uppper) for AE	1E	1E

Page 182

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
AE	NTSC PLAL/H DEF	DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay	23	23
B1	CORE YGAIN	Core field data 0 byte gain	3F	3F

7-2. CAMERA SYSTEM ADJUSTMENT

Page 195 of CCD-FX400E
Page 193 of CCD-FX300E

17. MAX GAIN Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	$A=160^{+5}_{-15}$ mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

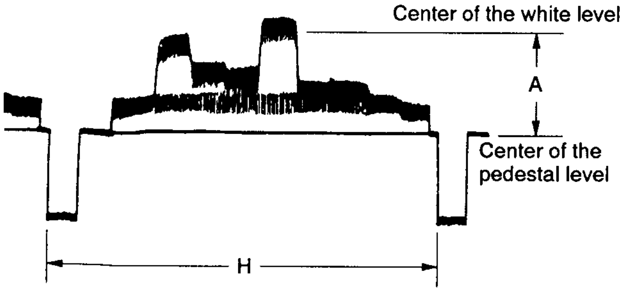


Fig. 7-14.

Page 197 of CCD-FX400E
Page 195 of CCD-FX300E

20. Color Reproduction Adjustment

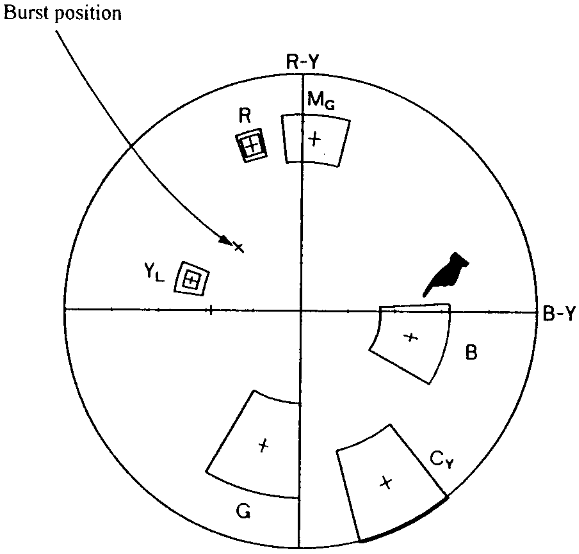


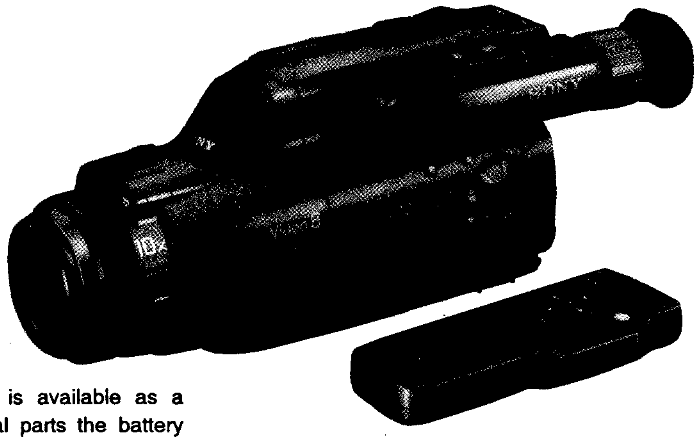
Fig. 7-16.

9-973-390-11
Sony Corporation
Personal Video Group
English
93C0975-1
Printed in Germany
© 1993. 3
Published by CV Quality Engineering DIV.

CCD-FX400E
RMT-509

SERVICE MANUAL

AEP Model
UK Model
Australian Model



Remote commander is available as a unit, but as individual parts the battery case lid of commander is only avaiable.

Video8
Handycam

A MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ" (9-973-199-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 2.0051 cm/sec. LP mode: Approx. 1.0058 cm/sec.
Recording/Playback time	SP mode: 1 hour 30 min. (P5-90) LP mode: 3 hours (P5-90)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 10 × power zoom lens f=6.1 to 61 mm ($\frac{1}{4}$ to $2\frac{1}{2}$ inches) Approx. 44 to 440 mm ($1\frac{3}{4}$ to $17\frac{3}{8}$ inches) converted into the focal length of a 35 mm still camera. F 1.6 with macro Filter diameter: 37 mm ($1\frac{1}{2}$ inches) TTL autofocus system inner focus wide macro system
Colour temperature	AUTO
Minimum illumination	3 lx
Illumination range	3 lx to 100,000 lx (0.3 to 9294 footcandles)
Recommended illumination	More than 100 lx (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connectors

AEP, UK model

Video output	Phono jack 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack –7.5 dBs, (at load impedance 47 kilohms) impedance less than 1 kilohm

Australian model

Video input/output	Selectable with the INPUT/OUTPUT selector Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative

— Continued on next page —

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

Audio input/output	Selectable with the INPUT/OUTPUT selector Phono jack Input: –7.5 dBs, input impedance more than 47 kilohms Output: –7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote ◑ jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	5.7 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 118 × 108 × 265 mm (w/h/d) ($4\tfrac{3}{4} \times 4\tfrac{3}{8} \times 10\tfrac{1}{2}$ in.)
Mass	Approx. 820 g (1 lb 12 oz) excluding the battery pack, lithium battery, cassette, lens cap, jack cover and shoulder strap Approx. 1060 g (2 lb 5 oz) including the battery pack NP-55H, lithium battery CR2025, cassette P5-90, lens cap, jack cover and shoulder strap
Microphone	Electret condenser microphone, uni-directional, monaural type

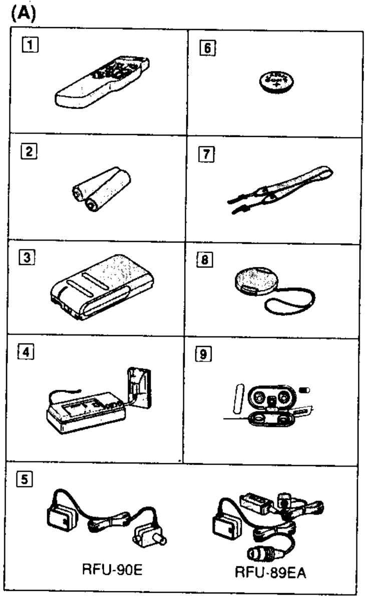
Wireless Remote Commander

Remote control system	Infrared control
Command mode	VTR 2
Power requirements	3 V DC, 2 size AA (R6) batteries
Dimensions	Approx. 48 × 19 × 130 mm (w/h/d) ($1\tfrac{15}{16} \times \tfrac{3}{4} \times 5\tfrac{1}{8}$ inches)
Mass	Approx. 50 g (1.8 oz) (excluding batteries)

Design and specifications are subject to change without notice.

Supplied Accessories

(A)



(A)

1 Remote Commander (1) (page 6)

2 Size AA (R6) battery for Remote Commander (2) (page 6)

3 Battery pack NP-55H (1) (page 8)

4 AC power adaptor AC-V60A (1) (pages 8, 11)

5 RFU adaptor RFU-90E or RFU-89EA (1) (pages 32, 33)
(With the RFU-89EA, an aerial selector and a screwdriver are supplied.)

6 Lithium battery CR2025 (1) (page 14)

7 Shoulder strap (1) (page 5)

8 Lens cap (1) (attached to the camcorder) (page 20)

9 Jack cover (1) (attached to the camcorder)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

Section Title Page

SERVICE NOTE

Semiconductor for Correction List Display 6
Parts Location Diagram Related to Power Supply 6
Semiconductor Location 6
Head Cleaning 6

1. GENERAL

Identifying the Parts 7
Connecting the Power Sources 8
Using the Best out of the Battery Pack 11
Setting the Date and Time 12
Inserting a Cassette 14
Adjusting the Viewfinder Lens 14
Recording a Picture Using Automatic Adjustments 15
Making Manual Adjustments 18
Manual Focusing 18
Compensating Backlighting 19
Using PROGRAM AE 20
Fade-in and Fade-out 20
Connections for Playback 21
Playing Back a Tape 23
Using the Tape Counter 24
Editing onto another VTR 24
Hints for Better Shooting 25
Notes and Precautions 25
Using your Camcorder Abroad 26
Indicators in the Viewfinder 27

2. DISASSEMBLY

2-1. Removal of Variable Resistor 28
2-2. Removal of Cabinet (Upper) Assembly 28
2-3. Removal of Cassette LID Assembly 28
2-4. Removal of Cabinet (L) Assembly 28
2-5. Removal of VK-22 and PJ-45 Boards 29
2-6. Removal of Cabinet (R) Assembly 29
2-7. Removal of CK-47, DK-20 and PK-30 Boards 29
2-8. Removal of EVF Assembly (VF-44 Board) 30
2-9. Removal of LS LID Assembly 30
2-10. Removal of PS-282 Board 30
2-11. Removal of Zoom Lens Assembly 31
2-12. Removal of VA-71 and CS-31 Boards 31
2-13. Removal of SL-22 Board 31
2-14. Internal Views 32

Section Title Page

3. DIAGRAMS

3-1. Circuit Boards Location 33
3-2. Overall Block Diagram 34
3-3. Camera (1) Block Diagram 37
3-4. Camera Microprocessor Pin Function (IC709 on CS-31 Board: CXP80624-299Q) 41
3-5. Camera (2) Block Diagram 43
3-6. Video (1) Block Diagram 45
3-7. Video (2) Block Diagram 49
3-8. Servo Block Diagram 52
3-9. System Control Block Diagram 55
3-10. Mechanism Control Microprocessor Pin Function (IC503 on CS-31 Board: CXP80624) 58
3-11. Mode Control Microprocessor Pin Function (IC506 on CS-31 Board: μPD75316) 61
3-12. Interface 63
  3-12-1. System Control – Video/Audio Block Interface (CS-31 Board) 63
  3-12-2. System Control – Servo Block Interface 65
3-13. Audio Block Diagram 68
3-14. EVF Block Diagram 71
3-15. Power Block Diagram 74

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. Frame Schematic Diagram 77
4-2. Printed Wiring Boards and Schematic Diagrams 80
- CD-61 Board 81
- CS-31 (Camera, REC/PB Amp, Servo/System Control), FP-488 Boards 87
- CS-31 (Camera) Board 91
- CS-31 (Camera), FP-488 Boards 99
- CS-31 (REC/PB Amp) Board 102
- CS-31 (Servo/System Control) Board 105
- VA-71 (Video, Audio) Board 109
- VA-71 (Video) Board 113
- VA-71 (Audio) Board 121
- SL-22 Board 123
- CK-47, PK-30, DK-20, SW-200, VK-22, MA-93, PJ-45 Boards 129
- VF-44 Board 136
- PS-282 Board 141

4-3. Semiconductors 146

Section Title Page

5. EXPLODED VIEWS

5-1. Cabinet (Upper), (L) Assemblies ······ 147
5-2. Cabinet (R), EVF Assemblies ······ 148
5-3. Main Board Assembly ······ 149
5-4. Cassette Compartment Assembly ······ 150
5-5. LS Chassis Assembly ······ 151
5-6. Mechanism Chassis Assembly (1) ······ 152
5-7. Mechanism Chassis Assembly (2) ······ 153
5-8. Zoom Lens Assembly (VCL-6110WA), (VCL-6110WC) ······ 154

6. ELECTRICAL PARTS LIST ······ 155

7. CAMERA SECTION ADJUSTMENT

7-1. Preparations Before Adjustment (Camera Section) ······ 175
7-1-1. List of Service Tools ······ 175
7-1-2. Preparations ······ 177
7-1-3. Precautions ······ 178
1. Switch settings ······ 178
2. Adjustment procedure ······ 178
3. Subject ······ 178
7-1-4. Adjusting Remote Control Unit ······ 179
1. Using the adjusting remote control unit ······ 179
2. Precautions upon using the adjusting remote control unit ······ 179
7-1-5. Page F Address List ······ 180
7-1-6. 6 Page, 1 Page Address List ······ 186
7-1-7. Page 6 ······ 186
7-1-8. Page 1 ······ 186
7-1-9. Adjustment Connector ······ 187
7-1-10. Data Processing ······ 187
7-2. Camera System Adjustment ······ 188
1. Power Supply Voltage Check (PS-282 board) ······ 188
2. Page F data initialization ······ 188
3. Page F data modification ······ 188
4. 28 MHz original oscillation adjustment (CS-31 board) ······ 189
5. V SUB adjustment (CS-31 board) ······ 189
6. VRG adjustment (CS-31 board) ······ 189
7. CCD imager correction data write ······ 189
8. HALL adjustment ······ 190
9. Flange back adjustment ······ 191
10. Flange back check ······ 191
11. SYNC level adjustment (CS-31 board) ······ 192
12. BURST level adjustment (CS-31 board) ······ 192
13. A/D offset adjustment ······ 193
14. Carrier balance adjustment ······ 193
15. Picture frame setting ······ 194
16. IRIS level adjustment (CS-31 board) ······ 194
17. MAX GAIN adjustment (CS-31 board) ······ 195
18. IRIS IN/OUT adjustment ······ 195
19. Pre-white balance adjustment ······ 196
20. Color reproduction adjustment ······ 197
21. Auto white balance preset adjustment ······ 198
22. Auto white balance adjustment ······ 198
23. White balance check ······ 199
24. Linear matrix adjustment ······ 200
25. VIDEO OUT level check ······ 201
7-3. Electronic Viewfinder System Adjustment (VF-44 Board) ······ 201
7-3-1. Horizontal Tilt Adjustment ······ 201
7-3-2. Centering Adjustment ······ 202
7-3-3. AFC Adjustment (VF-44 Board) ······ 202
7-3-4. Horizontal Amplitude Adjustment (VF-44 Board) ······ 202
7-3-5. Vertical Amplitude Adjustment (VF-44 Board) ······ 203
7-3-6. Focus Adjustment (VF-44 Board) ······ 203
7-3-7. Brightness, Contrast Adjustments (VF-44 Board) ······ 203
7-4. Arrangement Diagram for Adjustment Parts ······ 204

8. MECHANICAL SECTION ADJUSTMENT

8-1. Setting the Track Shift Mode ······ 209
8-2. Preparations for Adjustment ······ 209

9. VIDEO SECTION ADJUSTMENT

9-1. Preparations Before Adjustment ······ 210
9-1-1. Equipments to be used ······ 210
9-1-2. Connecting the equipments ······ 210
9-1-3. Precautions upon adjustment ······ 211
9-1-4. How to Set the REC Mode in the Model without REC Switch ······ 211
9-1-5. Set-up during Adjustment ······ 212
9-1-6. Alignment Tape ······ 212
9-1-7. Input/Output Level and Impedance ······ 213
9-1-8. Service Mode ······ 214
1. Setting the service mode ······ 214
2. Types of self-diagnostic feature ······ 216
3. Page D write protect ······ 216
4. Page F write protect ······ 216
5. Test mode setting ······ 217
6. Emergency code ······ 217
7. Emergency mode ······ 218
8. Bit value discrimination ······ 218
9. Check of power switch, tape distinction switch, etc. ·· 219
10. RECOG SW Check ······ 219
11. Individual operations of the drum, capstan, and loading motor ······ 220
12. Mode switch check ······ 220
13. Mode control micro processor key matrix check ······ 221
14. Wireless remote control unit reception content check ······ 221
15. Page D address list ······ 222
9-2. Power System Adjustments ······ 224
1. Oscillator frequency check (PS-282 board) ······ 224
2. Power voltage check (PS-282 board) ······ 224
9-3. System Control System Adjustments ······ 224
1. Page D initial value Input ······ 224
2. Battery end adjustment ······ 225
3. Battery down check ······ 225
9-4. Servo System Adjustments ······ 226
1. Switching position adjustment (CS-31 board) ······ 226

Section Title Page

9-5. Video Adjustments ········ 226
1. Playback frequency characteristic adjustment (CS-31 board) ········ 227
2. Flying erase check (CS-31 board) ········ 227
3. VXO oscillation frequency check (VA-71 board) ········ 227
4. EE level adjustment (VA-71 board) ········ 228
5. IR adjustment (VA-71 board) ········ 228
6. Chroma comb filter adjustment (VA-71 board) ········ 229
7. Emphasis input level adjustment (VA-71 board) ········ 229
8. PB Y level adjustment (VA-71 board) ········ 230
9. PB LINE OUT level adjustment ········ 230
10. Y FM carrier frequency adjustment (VA-71 board) ········ 231
11. Deviation adjustment (VA-71 board) ········ 231
12. Chroma emphasis f0 adjustment (VA-71 board) ········ 232
13. REC Y level adjustment (VA-71 board) ········ 232
14. REC C RF level adjustment (VA-71 board) ········ 233
15. REC ATF level checking (CS-31 board) ········ 233
9-6. Audio System Adjustment ········ 234
1. Carrier frequency check (VA-71 board) ········ 235
2. Record level check (VA-71 board) ········ 235
3. E-E output level check (VA-71 board) ········ 235
4. IR adjustment (VA-71 board) ········ 235
5. Deviation adjustment ········ 235
6. Overall level characteristic, distortion check ········ 236
7. Overall noise level check ········ 236
9-7. Arrangement Diagram for Adjustment Parts ········ 238

There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

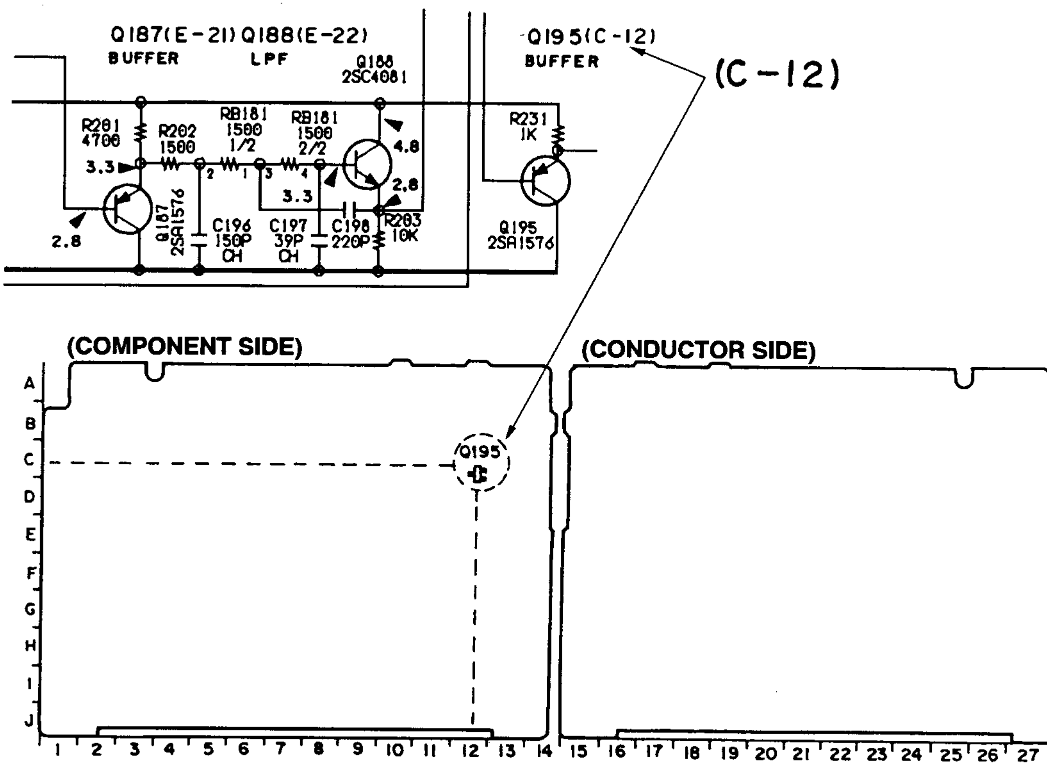
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 87, 107, 141, 143.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.



Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
2.8
4.8
2.8
3.3
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
2
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6
7
8
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10
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27

[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✪] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

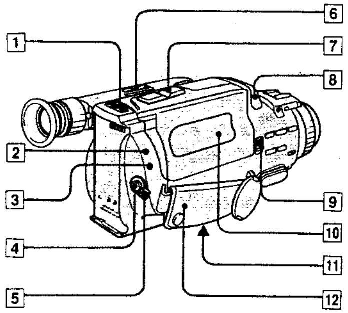
[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

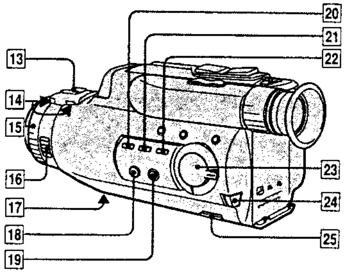
SECTION 1
GENERAL

Identifying the Parts

(B-1)



(B-2)



For details on the use of each part, refer to the pages indicated in the parenthesis.

(B-1)

1 POWER switch (15)

2 REMOTE ⊄ (LANC)* control connector (stereo mini-minijack) (26)

3 Ⓡ (earphone) jack (minijack) (25)

4 START/STOP button (20)

5 STANDBY switch (15)

6 EDITSEARCH (and ⊜ recording review) button (24, 25)

7 Power zoom (MACRO) button (23)

8 Built-in microphone

9 EJECT (cassette eject) knob (18)

10 Cassette holder (18)

11 Lithium battery holder (14)

12 Grip strap (20)

(B-2)

13 Accessory shoe (26)

14 Remote control sensor (7)

15 Focus ring (28)

16 FOCUS (AUTO/MANUAL/PUSH AUTO) switch (20, 28)

17 Tripod receptacle (bottom)

18 FADER button (31)

19 BACK LIGHT button (29)

20 DATE (+) button (15, 16, 22)

21 TIME (NEXT) button (15, 16, 22)

22 AGE/EVENT button (16, 22)

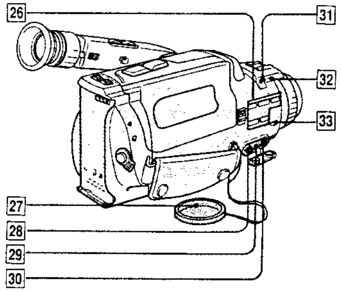
23 PROGRAM AE selector (20, 30)

24 BATT (battery eject) knob (9)

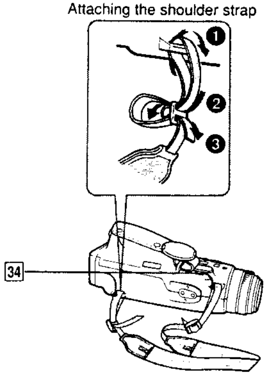
25 Shoulder strap hook (5)

***About the ⊄(LANC)**
⊄LANC stands for Local Application Control Bus System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

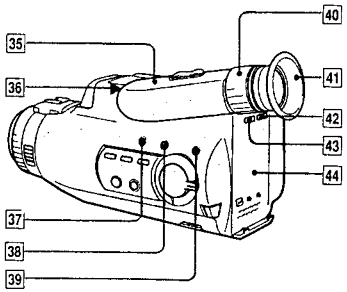
(B-3)



(B-4)



(B-5)



This section is extracted from instruction manual.

Identifying the Parts

(B-3)

26 Tape transport buttons (36, 37)
- ▷ PLAY (playback)
- ▶▶ FF (fast-forward)
- ◀◀ REW (rewind)
- □ STOP (stop)
- II PAUSE (pause)

27 Lens cap (20)

28 VIDEO output jack (phono jack) (35)

29 RFU DC OUT (RFU adaptor DC output) jack (special minijack) (26)

30 AUDIO output jack (phono jack) (35)

31 MIC jack (PLUG IN POWER) (mono mini-jack) (26)

32 Remote control sensor (7)

33 REC MODE (recording mode)/EDIT switch (20, 39)

Mode	Recording	Playback	Editing
Setting	SP ◫ LP ←	EDIT ◫ ←	EDIT ◫ →
Function	Recording mode switch	EDIT switch	

(B-4)

34 Shoulder strap hook

(B-5)

35 Viewfinder

36 Camera recording/battery lamp (9, 20, 47)

37 COUNTER RESET button (25, 38)

38 ZERO MEM button (25, 38)

39 TAPE/BATT CHECK button (9, 26)

40 Viewfinder adjustment ring (19)

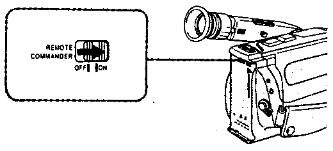
41 Eyecup (42)

42 BEEP ON/OFF switch (8)

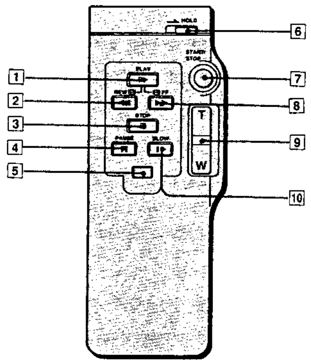
43 ◘ REMOTE COMMANDER ON/OFF switch (6)

44 Battery mounting surface

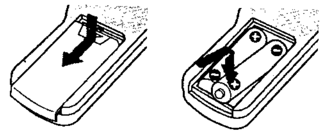
(B-6)



(B-7)



(B-8)



Wireless Remote Commander

You can control camera recording and playing back from a distance. The buttons on the Remote Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander
Be sure to insert the supplied batteries into it and to set the ▣REMOTE COMMANDER ON/OFF switch on the camcorder to "ON". (B-6)
For details, refer to the pages indicated in the parenthesis.

(B-7)

1 **▷ PLAY (playback) button (25, 36)**

2 **◀◀ REW (rewind) button (25, 36)**

3 **□ STOP button (25, 36)**

4 **II PAUSE button (36)**

5 **DATA SCREEN button* (37)**

6 **HOLD switch***
Slide it in the direction of the arrow when you want to prevent the buttons on the camcorder from being accidentally pressed.

7 **START/STOP button (20)**

8 **FF ▶▶ (fast forward) button (36, 37)**

9 **Power zoom button (23)**

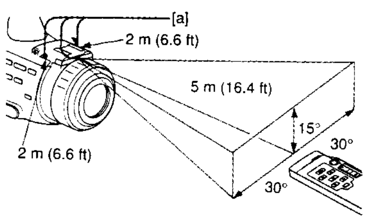
10 **I▶ SLOW (slow playback) button* (37)**

Note
The * indicates the functions which are operable only with the Commander.

Inserting batteries (B-8)
Insert two size AA (R6) batteries with the + and – ends properly position.

Note on batteries
With normal operation, batteries will last for about six months. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.

(B-9)



Remote controllable area (B-9)
Aim the Commander at the remote sensor [a] on the camcorder. The illustration shows the approximate maximum distance and angle for remote control.

Notes on the Remote Commander
- **Keep the remote sensor away from the strong light source such as direct sunlight or illumination. Remote control with the Commander may not be effective.**
- Be sure that there is no obstacle between the remote sensor and Commander.
- This camcorder works through the signals of commander mode VTR 2. A commander mode is used to distinguish this camcorder from other Sony VTR to avoid misoperation. If you use another Sony VTR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VTR with black paper.

Preparing your camcorder 1

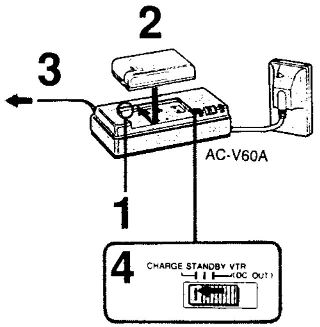
Connecting the Power Sources

First, Choose the Power Source.

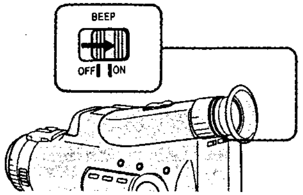
For details, see the operation manual of the accessory you want to use.

Place	Power source	Accessory to be used
Out-doors	Battery pack	NP-55H (supplied), NP-55, NP-66H, NP-77, NP-77H or NP-77HD
	Alkaline batteries	Battery case EBP-77
Indoors	House current	AC power adaptor AC-V60A (supplied), AC-V30, AC-V35 or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77, car battery charger DC-S10 or AC power adaptor AC-V55 and car battery cord DCC-16AE

(C-1)



(C-2)



Using the Battery Pack

Step 1

Charge the battery pack. (C-1)

1. **Align the side of the battery pack with the side of the AC power adaptor.**
2. **Slide the battery pack in the direction of the arrow.**
3. **Connect the AC power adaptor to a wall outlet.**
4. **Set the CHARGE/VTR selector of the AC power adaptor to CHARGE.**
   Charging begins.

	NP-55H (supplied)	NP-77H NP-77HD	NP-77	NP-66H	NP-55
Required charging time*	70	140	120	100	60
Battery life**	75	150	120	110	60

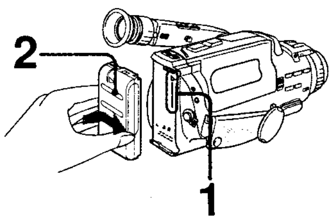
* Approximate time in minutes using AC-V60A
**Approximate time in minutes using fully charged battery pack, continous recording indoors

When charging is finished, the charge indicator on the AC power adaptor will go out.

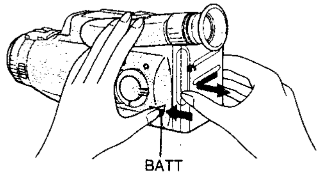
Using the BEEP switch
Before mounting the battery pack, check the BEEP switch preset to ON.
It beeps when you start and stop recording, and if any difficulty should arise during operation.
If you want to deactivate the beeps, set the BEEP switch to OFF before mounting the battery pack. **(C-2)**

Notes
- Beeps are not recorded on the tape.
- For warning beeps, see page 47.

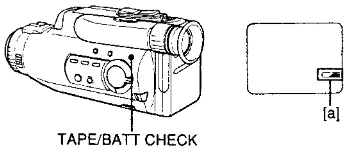
(C-3)



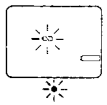
(C-4)



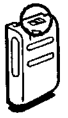
(C-5)



(C-6)



(C-7)



Step 2

Mount the battery pack on the camcorder. (C-3)

1. **Align the right side of the battery pack with the white line on the camcorder.**
2. **Slide in the battery pack to the right.**
   Make sure the battery is securely installed so that it does not fall.

Removing the battery pack (C-4)
Press the BATT knob in the direction of the arrow, and at the same time, slide out the battery pack to the left.

Battery life indicator

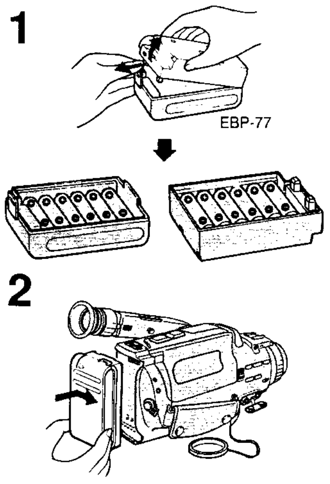
To check the remaining battery capacity, set the POWER switch to CAMERA, set the STANDBY switch up (see page 15) and press TAPE/BATT CHECK. The black bar of the battery life indicator [a] in the viewfinder shows remaining battery power **(C-5)**. After the black bar disappears, the ▭ indicator and a red lamp will flash in the viewfinder **(C-6)**. The battery lamp on the camcorder will flash also.

Note
The battery life indicator of the camcorder may indicate a different remaining capacity from that on the NP-77HD battery pack.

How to use the switch on the battery pack (C-7)
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

Other options for charging
- AC-S10 AC power adaptor:
  This adaptor has a discharging function.
  It charges the battery pack after ensuring optimum battery capacity by complete discharging.
- DC-S10 car battery charger:
  This charger has a discharging function. When you want charging only, slide the skip switch on the charger in the direction of the arrow.

(C-8)



Using Alkaline Batteries

(C-8)

The battery case EBP-77 (not supplied) is required.

Note
You cannot use manganese batteries.

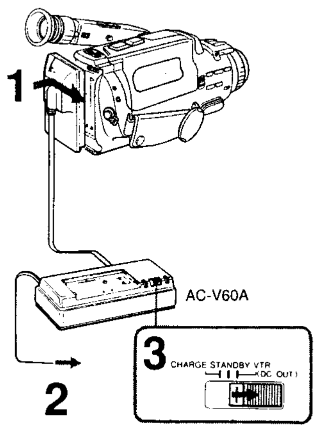
1. **Insert 12 R6 (AA) size alkaline batteries into the battery case.**
2. **Attach the battery case in the same way as the battery pack.**

Battery life (when using Sony alkaline batteries)
The battery lasts for approximately 2 hours and 15 minutes under continuous recording indoors. However, when you use non-Sony alkaline batteries, their life may shorten.

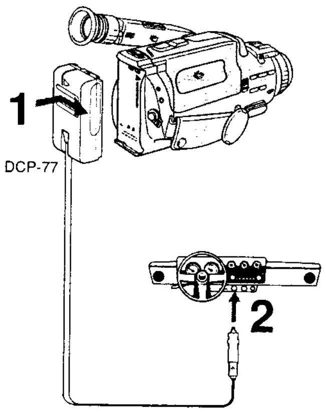
Notes on battery life
- Batteries will not last as long in cold places.
- No indicator appears in the viewfinder when the batteries are weak.

To remove the battery case
Remove it in the same way you do the battery pack. See page 9.

(C-9)



(C-10)



Using Household Current

(C-9)

Use the supplied AC power adaptor AC-V60A.

1. **Align the right side of the connecting plate with the line on the camcorder, and slide it in the direction of the arrow.**
2. **Connect the AC power adaptor to a wall outlet.**
3. **Set the CHARGE/VTR selector of the AC power adaptor to VTR.**

Removing the connecting plate
Remove it in the same way as you do with the battery pack. See page 9.

Using Car Battery

(C-10)

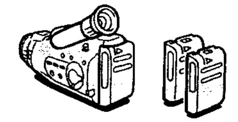
The DCP-77 DC pack is required (not supplied).

1. **Align the right side of the DC pack with the line on the camcorder, and then push down and slide it in the direction of the arrow.**
2. **Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).**

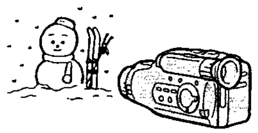
Removing the DC pack
Remove it in the same way as the battery pack. See page 9.

Using the Best out of the Battery Pack

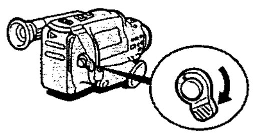
(D-1)



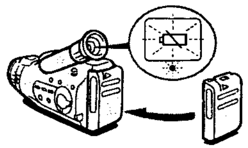
(D-2)



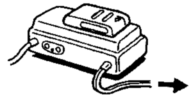
(D-3)



(D-4)



(D-5)



How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 to 3 times as much recording than you have planned. (D-1)
"Battery life" as indicated in the operation manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a fully charged battery.

Battery life is shorter in a cold climate. (D-2)
Battery efficiency is decreased and the battery will be used up more quickly.

Turn the STANDBY switch of the camcorder down when not recording to save battery power.
A smooth recording can be made even if recording is stopped and started again. (D-3)
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

When the Rechargeable Battery Pack Should Be Replaced

After the black bar disappears in the battery life indicator, the ▭ indicator and a red lamp will start flashing in the viewfinder. When they change from slow flashing to fast flashing, replace the battery pack. (D-4)
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

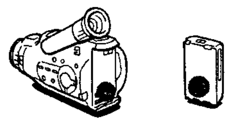
Notes on Charging

Before using the battery pack, charge it sufficiently. A new battery pack is not charged.

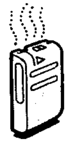
Recharge the battery pack only when it is exhausted. (D-5)
- Make sure to use up the battery before charging.
- If recording is completed before the ▭ indicator appears in the viewfinder, it is recommended that you remove the cassette, set the POWER switch to CAMERA, turn the STANDBY switch up until it snaps, and leave the camcorder until the recording/battery lamp flashes rapidly. When using the AC-S10 AC power adaptor or the DC-S10 car battery charger, you can discharge the battery with their discharging function.
- Repeated charging while some capacity remains causes a lowering of battery capacity.
  However, **the original battery capacity can be recovered if you fully discharge and charge the battery again.**

Recharge the battery pack just before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

(D-6)



(D-7)



Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. (D-6)
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

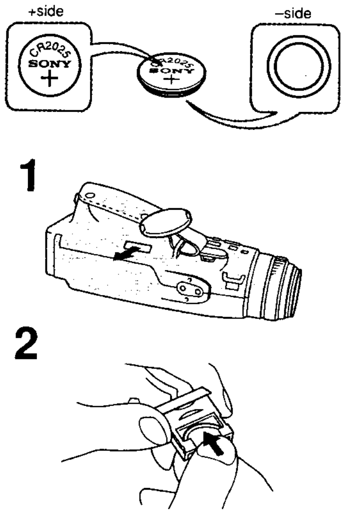
Why the battery pack heats up (D-7)
During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not a cause for concern.

How to care for the battery pack
- Remove the battery pack from the camcorder after using it, and keep it in a cool place.
  When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging.
  Thus, it is recommended you charge the battery before using.

How many times can the battery pack be recharged
It can be fully charged and discharged about 500 times under normal temperatures.
If the ▭ indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack is dead. The battery pack should be replaced with a new fully charged one.

Temperatures during charging
Charge under temperatures ranging from 10 to 30°C (50 to 85°F). Lower temperatures require a longer charging time.

(E-1)



Preparing your camcorder 2

Setting the Date and Time

Inserting the Lithium Battery

(E-1)

To keep birth dates in the camcorder's memory as well as to activate the clock, a lithium battery (supplied) must be installed.
The lithium battery has a + (plus) side and a – (minus) side. **Be sure to install the supplied lithium batteries with the + and – ends properly position.**

1 **Remove the lithium battery holder located at the bottom of the camcorder.**

2 **Install the supplied CR2025 lithium battery with the + side facing down.**

3 **Put the lithium battery holder into the camcorder.**

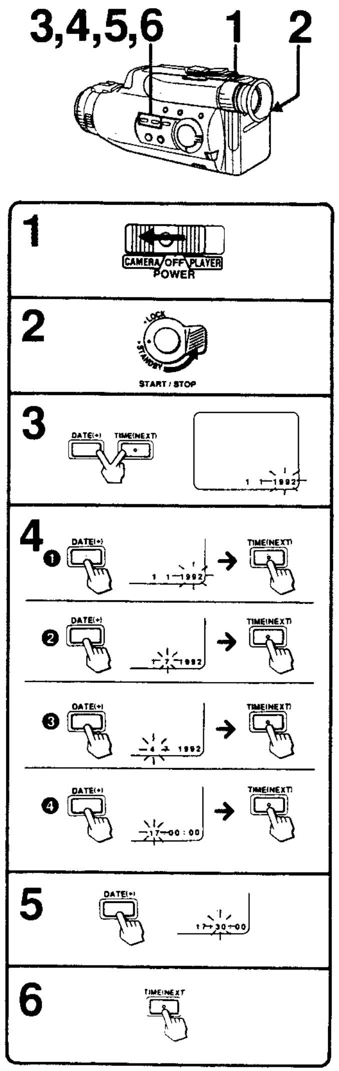
Changing the lithium battery
Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Note on lithium battery life
The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the ♁ indicator will flash in the viewfinder screen for about 5 seconds (when the POWER switch is set to CAMERA).
In this case, **replace the battery with a Sony CR2025.**
Use of any other battery may present a risk of fire or explosion.
While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time and birth dates are necessary.

CAUTIONS
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

WARNING
The battery may explode if mistreated.
Do not recharge, disassemble or dispose of it in fire.

(E-2)



Setting the Date and Time

(E-2)

Make sure that a power source and lithium battery are attached.

1 **Press the small green button on the POWER switch and slide it to CAMERA.**

2 **Set the STANDBY switch up.**

3 **Press DATE (+) and TIME (NEXT) simultaneously for more than two seconds until the date indicator appears in the viewfinder.**
DATE (+) now functions as + (to advance numbers) and TIME (NEXT) functions as NEXT (to execute).

4 **Adjust the flashing digits of the year, month, day and hour using DATE (+), and press TIME (NEXT).**
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1992, and proceeds as follows:
  1992 ---→ 1999 → 2000 ---→ 2020

5 **Adjust the flashing digits of minute using DATE (+).**

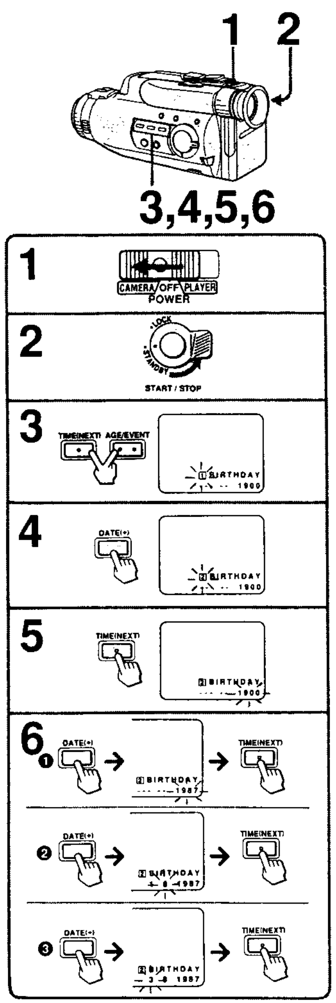
6 **Press TIME (NEXT) to set the second to "00".**
The clock starts working.

Correcting date and time setting
Repeat steps 3 to 6.

Checking the preset date and time
Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

If the camcorder goes off abruptly while setting the date and time
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will turn off automatically. Set the STANDBY switch down once and set it up again.

(E-3)



1
2
3,4,5,6
1
CAMERA/OFF/PLAYER
POWER
2
LOCK
STANDBY
START/STOP
3
TIME(NEXT) AGE/EVENT
1 BIRTHDAY
1900
4
DATE(+)
1 BIRTHDAY
1900
5
TIME(NEXT)
2 BIRTHDAY
1900
6
❶
DATE(+)
2 BIRTHDAY
1987
TIME(NEXT)
❷
DATE(+)
2 BIRTHDAY
8 1987
TIME(NEXT)
❸
DATE(+)
2 BIRTHDAY
3 8 1987
TIME(NEXT)

Storing a Birth Date in Your Camcorder

(E-3)

When you preset your child's birth date in the camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update the age of your child. You can superimpose the age any time on your recording. You can preset up to three birth or event dates.

Before you begin
Before storing the birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

Storing birth date
Example: Store "Aug. 3 1987" in memory 2.

1 **Set the POWER switch to CAMERA.**

2 **Set the STANDBY switch up.**

3 **Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the " $\boxed{1}$ BIRTHDAY — — — 1900" indicator appears in the viewfinder.**

4 **Press DATE (+) to select $\boxed{2}$.**
Each time you press DATE (+), the indicator in the viewfinder changes as follows:

$\boxed{1}$ BIRTHDAY → $\boxed{2}$ BIRTHDAY
↑— $\boxed{3}$ EVENT* ←—┘

* Although "EVENT" is displayed on $\boxed{3}$, you can use it for age as well. $\boxed{1}$ and $\boxed{2}$ can also used for event.

5 **Press TIME (NEXT).**
The "1900" indicator flashes.

6 **Enter the birth date of your child.**
First adjust the flashing digits with DATE (+), and then press TIME (NEXT). The age (year and month) appears when all items are adjusted.

If you missed the correct number with DATE(+)
Keep pressing DATE (+).
The indicator changes as follows:

Year: → 1900 → 1901 ----→ Current year
└--- Current year minus 99 ←——┘

Month: 1→ 2---→ 12 →– –
↑————┘

Day: 1 → 2 ----→ 31
↑————┘

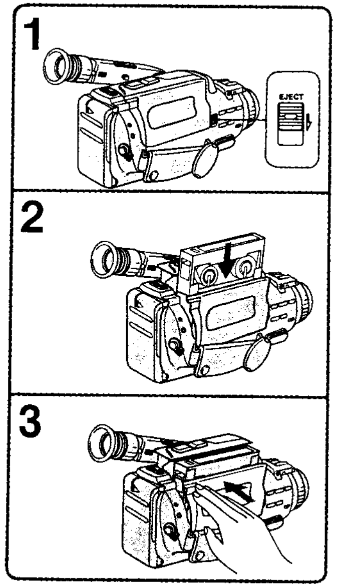
Correcting and changing the setting
Follow the procedures from step 1 again.

Advancing the digits faster
Keep DATE (+) pressed.

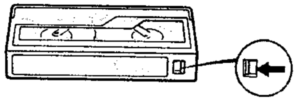
Presetting the year before 1900
1 After step 5 on page 16, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again
The year goes back 99 years.
(example: 1992 → 1893)
3 Go to step 6 in page 16.

When in 2000
"– – – –1901" is displayed in step 3 on page 16. After that, it advances every year "1902, 1903, ---".

(F-1)



(F-2)



Preparing your camcorder 3

Inserting a Cassette

Inserting a Cassette

(F-1)

Make sure that a power source is connected.

1 **While pressing the small blue button, push EJECT in the direction of the arrow.**
The cassette holder lifts up and opens.

2 **Insert a cassette with the window facing outside.**

3 **Press the PUSH mark to close the cassette holder.**

Ejecting the Cassette

Make sure that a power source is connected.
1 While pressing the small blue button, slide EJECT in the direction of the arrow.
2 Take out the cassette and press the PUSH mark to close the cassette holder.

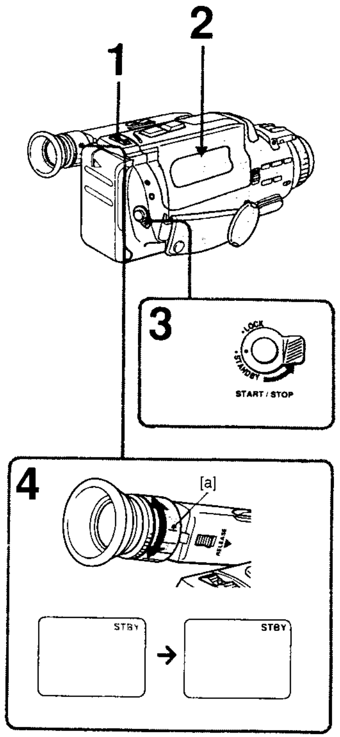
Preventing Accidental Erasure

(F-2)

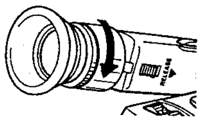
Slide the red tab to close the window to prevent accidental recording. To re-record on the tape, slide the tab opening the window.
If you try to record with the red mark exposed, the ☒ and ⏏ indicators flash in the viewfinder and beeps sound for about 5 seconds.

Note on handling cassettes
Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if red mark is exposed or covered, etc.

(G-1)



(G-2)



Preparing your camcorder 4

Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust it when using for the first time, or when using after someone else. **(G-1)**

Make sure a power source is connected.

1 **While pressing the green button, set the POWER switch to CAMERA.**

2 **Insert a cassette (see page 18).**

3 **Set the STANDBY switch up until it snaps.**

4 **Turn the viewfinder lens adjustment ring [a] so that the "STBY" in the viewfinder screen comes into sharp focus.**

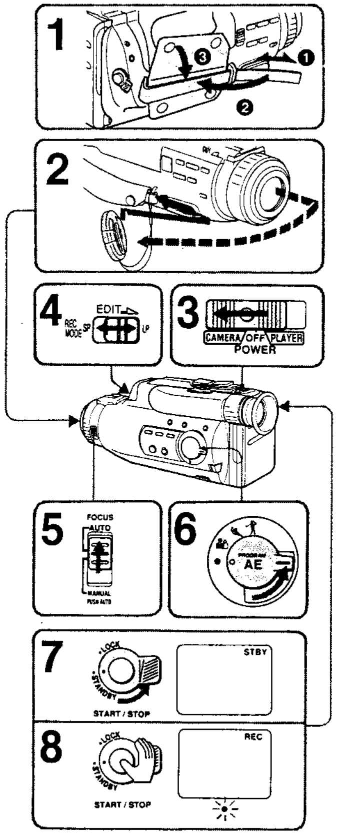
Using the viewfinder as a sports finder

The sports finder allows you to monitor the picture while your eye is at a distance from the eyecup.

Setting the viewfinder to the sports finder position
Turn the viewfinder adjustment ring clockwise completely. **(G-2)**

Returning to the normal viewfinder position
Turn the adjustment ring counterclockwise until "STBY" in the viewfinder comes into sharp focus when a cassette is in your camcorder.

(H-1)



Operating the Camera Section

Recording a Picture Using Automatic Adjustments

Before recording "once-only" events, we strongly recommend you make a trial record and check that everything is working perfectly.

To start Recording

(H-1)

1 **Hold the camcorder by putting your hand through the grip strap so that your thumb can easily press the red START/STOP button.**

2 **Remove the lens cap and attach it to the grip strap.**

3 **While pressing the green button, set the POWER switch to CAMERA.**

4 **Set the REC MODE switch to LP (long play) or SP (standard play), according to the length that you plan recording.**

5 **Set the FOCUS switch to AUTO.**

6 **Set the PROGRAM AE switch to the green position.**

7 **Turn the STANDBY switch up.**
"STBY" appears in the viewfinder. Now you can see through the viewfinder.

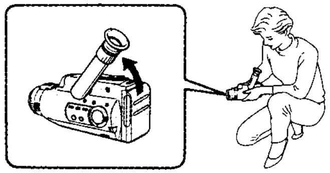
8 **Press START/STOP (red button).**
A beep sounds. "REC" appears and the red lamp lights up in the viewfinder and the camera recording/battery lamp lights on the camcorder. The camcorder is now recording.

When recording with the Remote Commander
Confirm that the ■ REMOTE COMMANDER switch is set to ON, see page 6. Aim the Commander at the remote sensor on the camcorder. Then press START/ STOP on the Commander to start recording. To standby (to stop recording momentarily), press it again. For preparation of the Commander, see pages 6 and 7.

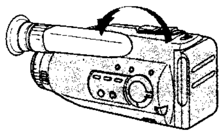
To standby (to stop momentarily)
Press START/STOP again.
Two beeps sound and "STBY" appears in the viewfinder.

To stop
Turn the STANDBY switch down and set the POWER switch to OFF.

(H-2)



(H-3)



For low-position recording (H-2)
Set the viewfinder to the sports finder position (page 19) and turn it for a recording in low position.
(The viewfinder barrel can be turned 180 degrees.)
(H-3)

Near the end of the tape
The ▣ indicator in the viewfinder and the camera recording/battery lamp on the camcorder flash slowly. When the tape reaches its end, flashing becomes rapid and beeps sound for about 5 seconds (if the BEEP switch is set to ON).

Notes on recording

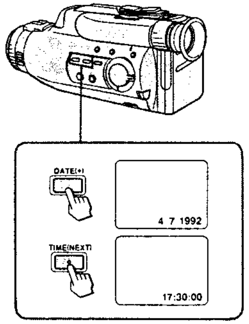
- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, set the STANDBY switch up until it snaps and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, set the STANDBY switch down once and slide it up again.

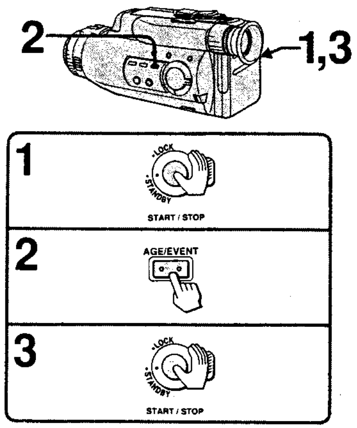
Note on light sources
If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

Recording mode
An 8 mm video format cassette records in the SP (standard play) mode and in the LP (long play) mode and can play back in the SP mode and LP mode.
The quality of the recording picture in the LP mode, however, will not be as good as that in the SP mode.

(H-4)



(H-5)



Recording the Date or Time

(H-4)

During camera recording or when in standby mode, press DATE (+) for the date indicator or TIME (NEXT) for the time indicator.
The date or time indicator displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE (+) or TIME (NEXT) again.
The picture recording continues.

Putting an Age on Your Tape

Here is how to put the ages of your children on your tape while recording. **(H-5)**

1 **During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.**
This puts the camcorder in standby mode.

2 **Press AGE/EVENT to select the indicator you want to record.**
Each time you press AGE/EVENT, the indicator changes as follows:

No indicator → [1] The first age
↑ ↓
[3] The third age ← [2] The second age

An item with no presetting is skipped. The [1], [2] or [3] indicator goes out after one second.

3 **Press START/STOP.**
Recording starts again. The age indicator in the viewfinder is recorded with the picture.

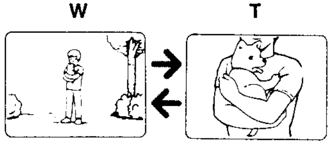
To stop recording the age
Press AGE/EVENT until the indicator goes out.

Changing the display while recording
Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you selected starts when [1], [2] or [3] goes out.

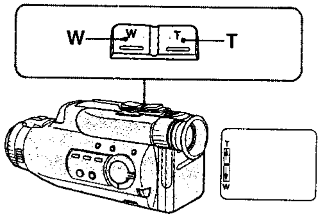
Canceling the stored birth date
1 Perform step 1 to 4 in “Storing a Birth Date in Your Camcorder” on page 16, to select the memory number to be canceled.
2 Press TIME (NEXT) twice. The month indicator flashes.
3 Press DATE (+) until “-- --” appears.
4 Press TIME (NEXT).
The birth memory is deleted from the memory and is not displayed when you press AGE/EVENT.

Note
You cannot add the age later during playing back or editing.

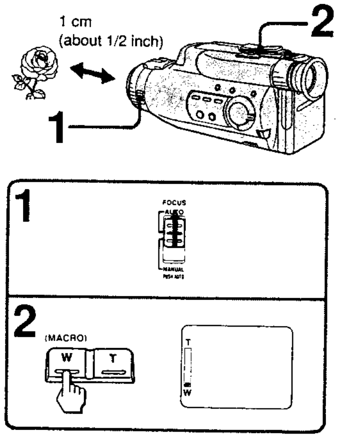
(H-6)



(H-7)



(H-8)



Using Zooming Features

By zooming, you can change the size of the subject in the scene. Use “zoom-in (Telephoto)” for dramatic close-ups, and “zoom-out (Wide-angle)” for panoramic long shooting. Also use the zoom to focus manually or to decide the shooting angle. A common mistake is using zoom-in or zoom-out too often. Use the zoom sparingly for zooming. **(H-6)**

Two-levels Speed Zooming (H-7)
The camcorder's power zoom button offers two-level speed zooming.
Press the button firmly for high speed zooming and softly for relatively slow zooming.
W side: for wide-angle (subject appears farther away)
T side: for telephoto (subject appears closer)

Two-level speed zooming cannot be operated with the power zoom button on the Commander.

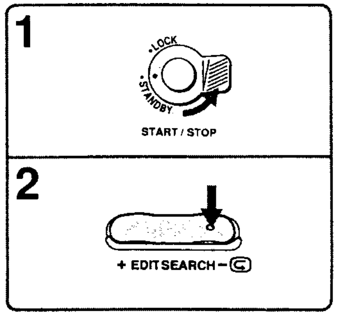
Autofocusing in macro (H-8)
You can shoot subjects that are at least 1 cm (about 1/2 inch) away from the lens surface.
When doing close-up, the depth of field (range the subject will be in sharp focus) is very shallow. So pay attention to focusing. To keep the subject in focus, use a tripod.

1 **Set the FOCUS switch to AUTO.**

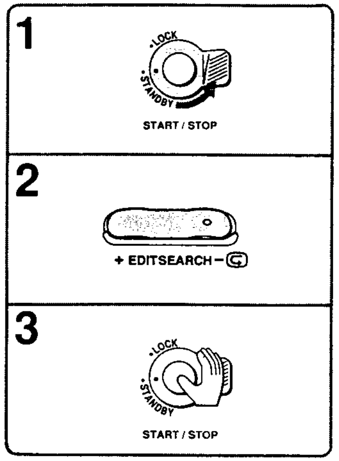
2 **Press the W side of the power zoom button until the indicator in the viewfinder stops at the W end.**

Manual focusing in macro
You can shoot with manual focus in doing close-up. For details, see page 28.

(H-9)



(H-10)



Checking the Recorded Picture in the Viewfinder (EDITSEARCH)

Using EDITSEARCH (⊜), you can review the last recorded scene or check the recorded picture in the viewfinder. After checking your recorded picture, you can also re-record over a previously recorded portion.

Reviewing the last recorded scene – Rec review
You can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks. **(H-9)**

1 **Set the camcorder into standby mode by setting the STANDBY switch up.**

2 **Press the – side of EDITSEARCH (⊜) momentarily.**
The last few seconds of the recording portion are played back in the viewfinder. Then, the camcorder goes back to standby mode, ready for the next recording.

Checking your recorded picture – Editsearch
You can check the recorded picture in the viewfinder. After checking, you can also re-record over a previously recorded portion. **(H-10)**

1 **Set the camcorder in standby mode by turning the STANDBY switch up.**

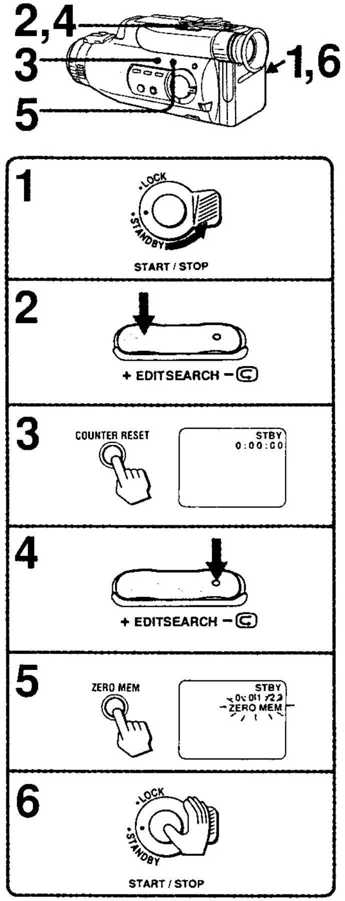
2 **Keep pressing the + side or – side of EDITSEARCH (⊜) to play back the picture while looking in the viewfinder.**
+ side: to view the forward playback picture
– side: to view the reverse playback picture
To stop playback, release EDITSEARCH.

3 **If you want to re-record over a recorded portion, follow the procedures below:**

1 Press the + or – side of EDITSEARCH to locate the point you want to begin the re-recording.

2 Press START/STOP to start re-recording. Re-recording begins from the point you released EDITSEARCH. As long as the tape is not ejected, the transition between the scenes will be smooth.

(H-11)



Monitoring the sound while viewing the playback picture in the viewfinder by using an earphone (not supplied)
1 Connect an earphone to the ⊛ jack.
2 While pressing the green button, set the POWER switch to PLAYER.
3 Press ◀◀ to rewind the tape and press □ where you want to stop.
4 Press ▷ to start playback.

Re-recording a Picture in the Middle of a Recorded Tape (Insert Recording)

(H-11)

1 **Set the STANDBY switch up to set the camcorder into standby mode.**

2 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**

3 **Press COUNTER RESET.**
The counter is reset to zero.

4 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**

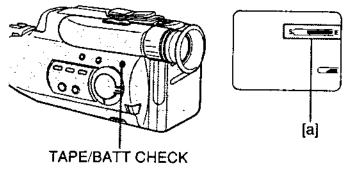
5 **Press ZERO MEM.**
The insert ending point is stored in memory.

6 **Press START/STOP.**
A beep sounds (if the BEEP switch is set to ON) and insert recording begins. The insert recording stops automatically near the counter zero point.

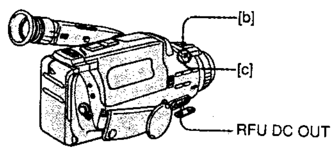
Canceling the ZERO MEM
Press ZERO MEM.

Note
The picture may be distored at the end of the inserted portion when played back.

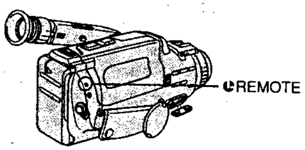
(H-12)



(H-13)



(H-14)



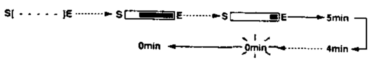
Recording a Picture Using Automatic Adjustments

Checking the time remaining of the tape

(H-12)

Press TAPE/BATT CHECK.

After pressing TAPE/BATT CHECK, the tape length indicator [a] may not appear for about 20 seconds. When the time remaining is less than about 5 minutes, the indicator shows the minutes remaining.



When "5 min" appears, the ▭ indicator flashes in the viewfinder.

Notes on the tape length indicator

- The camcorder must be in the recording or playback mode when TAPE/BATT CHECK is pressed to find out the time remaining. In the playback mode, however, the indicator does not show the minutes remaining.
- The tape length indicator does not change while using EDITSEARCH.

Recording with an External Microphone

(H-13)

You can connect an external microphone (not supplied) to the MIC jack [C]. This jack also accepts a "plug-in power" microphone.
If the microphone has two plugs, connect the DC IN plug to the RFU DC OUT jack on the camcorder.
Attach the microphone to the accessory shoe [b] of the camcorder.

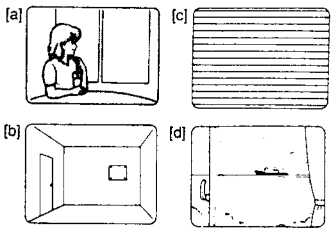
Note
When using an external microphone, wind noise is not muted.

Connecting a Wired Remote Control Unit

(H-14)

When you connect a wired remote control unit or editing controller (not supplied) to the REMOTE connector, you can operate your camcorder from a distance.

(I-1)



Making Manual Adjustments

The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for effective recording. You can manually adjust focus and back light compensation with this camcorder. The settings not changed to manual mode remain in the automatic mode.
As long as you do not remove the battery, even if you set the POWER switch to OFF, the previous manual settings are retained.

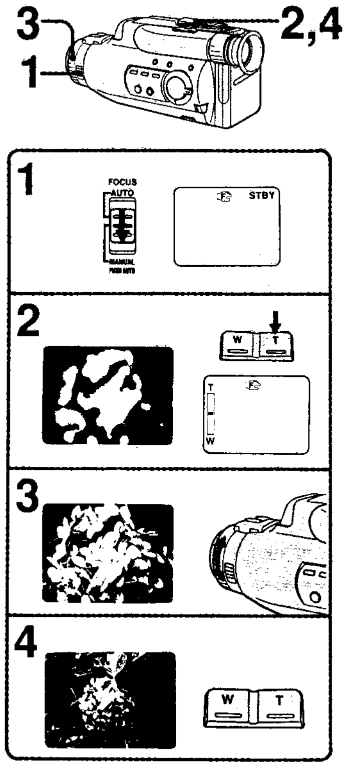
Manual Focusing

When using manual focus
You should also focus manually in the following situations **(I-1)**:

[a] Too bright behind the subject
[b] Subjects with little contrast-wall, sky, etc.
[c] Horizontal stripes
[d] Subject through frosted glass

- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder.
- Bright subject or subject reflecting light
- High contrast behind the subject (The background may be in focus.)
- When shooting a stationary subject using a tripod
- When you want to save battery power

(I-2)



Focusing Manually

(I-2)

1 **Set the FOCUS switch to MANUAL.**
The ⊕ indicator appears in the viewfinder.

2 **Keep pressing T side (telephoto) of the power zoom button until the zooming stops.**
The power zoom indicator appears in the viewfinder.

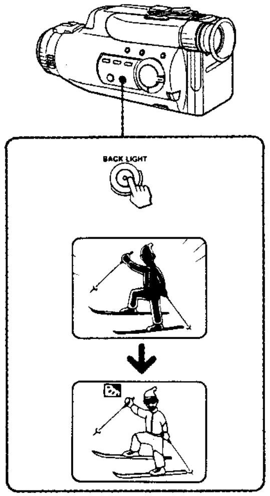
3 **Turn the focus ring to achieve sharp focus.**
The focusing ring does not have a stop position.

4 **Set the desired shot length using the power zoom button.**

Shooting with autofocusing momentarily
While shooting with manual focusing, push the FOCUS switch down to PUSH AUTO. The autofocusing functions **while you are pressing the button.** When you release the switch, manual focusing will be resumed. Use this function when you change the focus from one subject to another. The focusing performs naturally.
The previous settings except for focusing are retained.

Shooting in relatively dark places
Shoot at wide angles after focusing in telephoto.

(J)



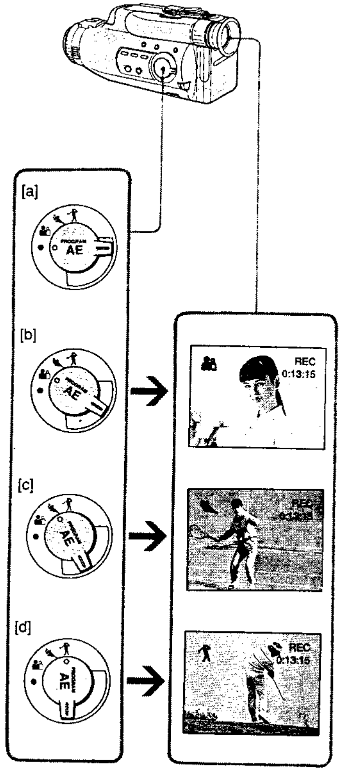
Compensating Backlighting

In this camcorder, the iris is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. **(J)**

Press BACK LIGHT.
The ⊠ indicator appears. If it does not appear, press the button again.

After shooting, be sure to release this adjustment condition by pressing BACK LIGHT again. (The ⊠ indicator goes out.)
Otherwise, the recorded picture will become too bright.

(K)



Using Program AE

When you see the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (shallow depth of field) or capture high-speed action with "sports" mode or "high-speed shutter" mode.

What is PROGRAM AE (Auto Exposure)?
Program AE automatically selects just the right combination of shutter and aperture settings and gives you creative control for depth of field (distance range of objects that will be in sharp focus.) There are four preprogrammed modes: Normal (the green position), Portrait, Sports and High-speed shutter.

(K)
Selecting AE mode
Set the PROGRAM AE selector to the desired mode.
The selected mode is indicated in the viewfinder.

To resume the automatic mode
Set PROGRAM AE to the green position. **[a]**

Use the appropriate mode when shooting the following subjects or when shooting under the following conditions.

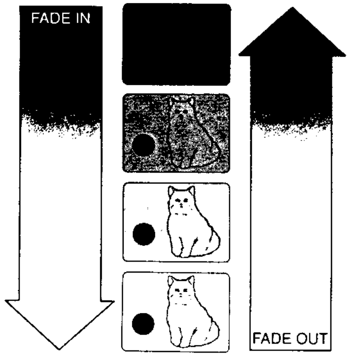
Portrait Mode [b]
- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- when there is something between the camcorder and the subject, such as a chain link fence

Sports Mode [c]
- outdoor sports scene such as football or tennis.
- recording a landscape in the running car
- subjects moving at high speed, such as a roller coaster on a cloudy day

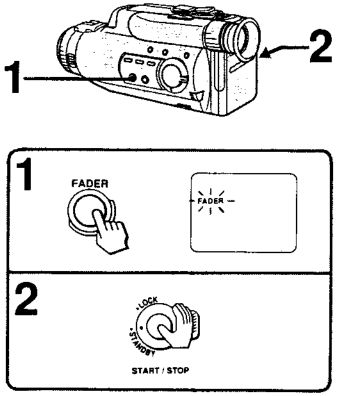
High-speed Shutter Mode [d]
- shooting a golf swing or a tennis match with the tennis ball captured clearly.
- you wish to play back certain scenes with high-speed movement in a clear, sharp picture.

Note
The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode — between 1/50 to 1/2000
Sports mode — between 1/50 to 1/500
High-speed shutter mode — 1/4000

(L-1)



(L-2)



Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional appearance.
When fading-in [a], the picture will gradually appear from black. The sound will also gradually increase.
When fading-out [b], the picture will gradually fade to black. The sound will decrease. **(L-1)**

(L-2)

Fading-in

1 **Press FADER after setting the STANDBY switch up to put the camcorder into standby mode.**
The fader indicator starts flashing.

2 **Press START/STOP.**
The fade indicator stops flashing and the recording starts fading in.

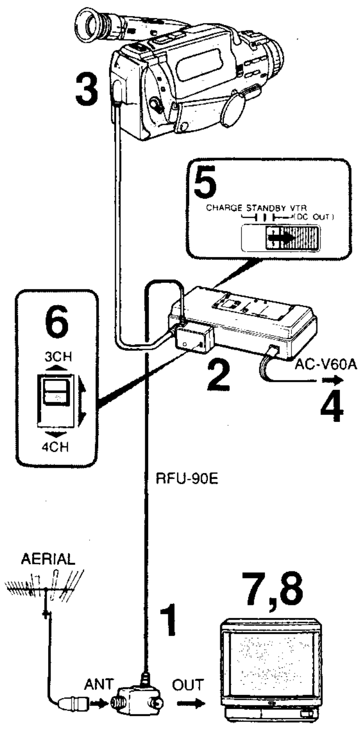
Fading-out

1 **Press FADER while recording.**
The fade indicator starts flashing.

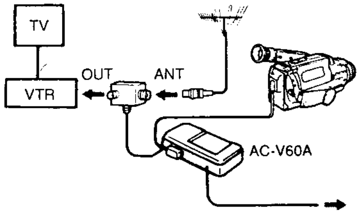
2 **Press START/STOP.**
The fade indicator stops flashing and the picture fades out and then the recording stops.

To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER again.

(M-1)



(M-2)



Operating the Player section

Connections for Playback

You must connect the camcorder to the TV and /or VTR properly to view the playback picture.
Check if your TV has audio/video input jacks. For details on the TV and VTR, refer to their operation manuals.

Connecting a TV without Audio/ Video input jacks

For the customers supplied with the RFU-90E

(M-1)

1 **Connect the aerial and TV to the RFU adaptor.**

2 **Connect the RFU adaptor to the AC power adaptor.**

3 **Attach the connecting plate of the AC power adaptor to the camcorder.**

4 **Connect the AC power adaptor to a wall outlet.**

5 **Set the CHARGE/VTR switch of the AC power adaptor to VTR.**

6 **Select the RF unit selector of the RFU adaptor to 3CH or 4CH whichever is not used in your area.**

7 **Turn on the TV and select the 0 position.**

8 **Tune the TV so that you can get picture and sound from the camcorder.**

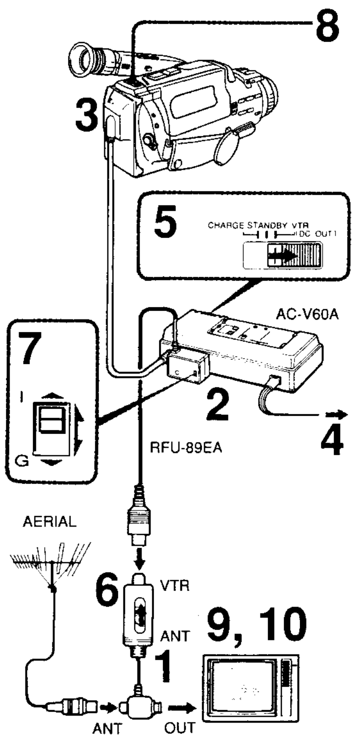
Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

When you watch a TV programme
Set the CHARGE/VTR switch on the AC power adaptor to STANDBY or turn off the power of the camcorder.

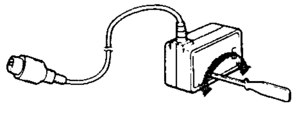
Without an AC power adaptor
You can also connect the RFU adaptor directly to the camcorder without an AC power adaptor, using the AUDIO/VIDEO (and RFU DC OUT) jacks.
In this case, keep the battery pack or other battery sources attached.

If your TV is connected with a VTR (M-2)
Connect the camcorder to the VTR instead of the TV.

(M-3)



(M-4)



For the customers supplied with the RFU-89EA

(M-3)

1 **Connect the aerial and TV to the RFU adaptor.**

2 **Connect the RFU adaptor to the AC power adaptor.**

3 **Attach the connecting plate of the AC power adaptor to the camcorder.**

4 **Connect the AC power adaptor to a wall outlet.**

5 **Set the CHARGE/VTR switch of the AC power adaptor to VTR.**

6 **Set the selector switch of the aerial selector to VTR.**

7 **Set the I/G selector of the RFU adaptor according to the TV system of your country.**

8 **Set the POWER switch of the camcorder to CAMERA, insert a cassette and set the STANDBY switch up.**

9 **Turn on the TV and select a programme position that is not used to receive a TV station.**

10 **Tune the TV so that you can get picture and sound from the camcorder.**

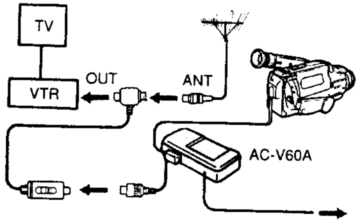
When the picture from the camcorder is not free of disturbance (M-4)

1 Set the ANT/VTR selector on the aerial selector to ANT.
2 Select a programme position between UHF channels 30 and 39 so that the TV shows no picture and a steady rustling sound or no sound is heard.
3 Set the ANT/VTR selector on the aerial selector to VTR.
4 Turn the screw on the RFU adaptor slowly with the supplied screwdriver so that the picture from the camcorder is clearly displayed on the TV screen.

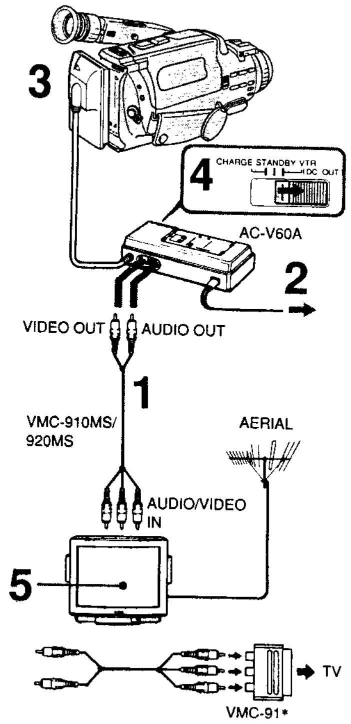
Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

When you watch a TV programme
Set the selector switch of the aerial selector to ANT.

(M-5)


TV
VTR
OUT
ANT
AC-V60A

(M-6)


3
4
CHARGE STANDBY VTR
DC OUT
AC-V60A
2
VIDEO OUT
AUDIO OUT
1
VMC-910MS/
920MS
AERIAL
AUDIO/VIDEO
IN
5
TV
VMC-91*

Without an AC power adaptor
You can also connect the RFU adaptor directly to the camcorder without the AC power adaptor, using the AUDIO/VIDEO (and RFU DC OUT) jacks.
In this case, keep the battery pack or other power souces attached.

If your TV is connected with a VTR (M-5)
Connect the camcorder to the VTR instead of the TV.

Connecting to a TV with Audio/ Video Input Jacks

(M-6)

Leave the TV aerial cable connected to the TV.

1 **Connect the AC power adaptor to the TV.**
Use an appropriate A/V connecting cable according to the connector type of your TV. Sony offers you the following cables (not supplied).
VMC–710M/720M: for monaural TV
VMC–910MS/920MS: for stereo TV
When your TV has a 21-pin connector (EUROCONNECTOR)*, use a 21-pin adaptor VMC-91 (not supplied).

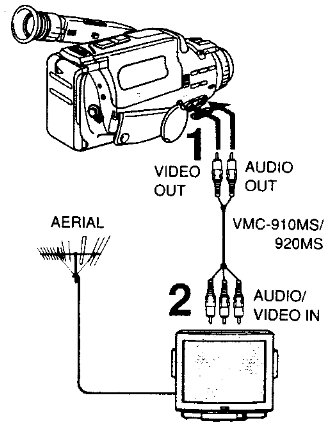
2 **Connect the AC power adaptor to a wall outlet.**

3 **Attach the connecting plate of the AC power adaptor to the camcorder.**

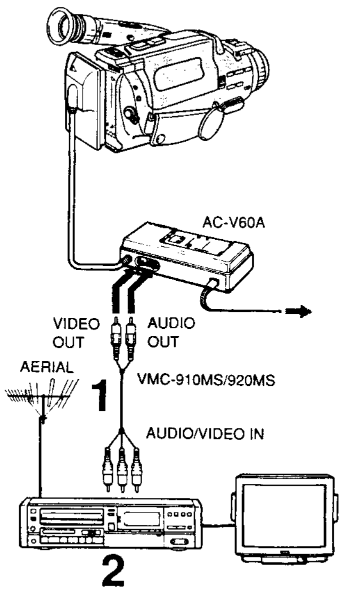
4 **Set the CHARGE/VTR switch of the AC power adaptor to VTR.**

5 **Turn on the TV and set the TV/VIDEO selector on the TV to VIDEO.**

(M-7)


1
VIDEO
OUT
AUDIO
OUT
AERIAL
VMC-910MS/
920MS
2
AUDIO/
VIDEO IN

(M-8)


AC-V60A
VIDEO
OUT
AUDIO
OUT
AERIAL
1
VMC-910MS/920MS
AUDIO/VIDEO IN
2

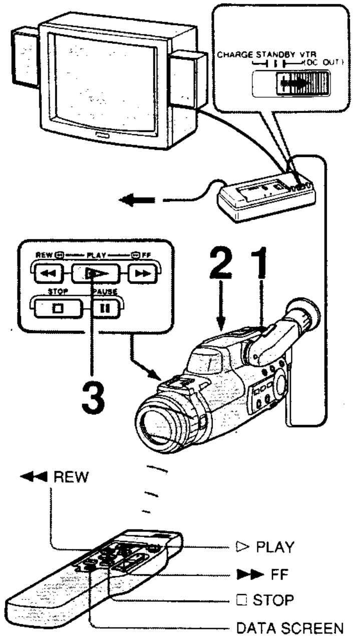
Connecting to a TV without an AC power adaptor (M-7)
Leave the TV aerial cable connected to the TV.

1 **Connect the A/V connecting cable (not supplied) directly** to the camcorder using the AUDIO/VIDEO jacks.
2 **Connect the other end of the A/V connecting cable to the TV.**

Connecting to a TV via a VTR (M-8)
Leave the VTR aerial cable connected to the VTR.

1 **Connect the camcorder to the VTR using the A/V connecting cable.**
2 **Set the input selector on the VTR to LINE and set the TV/VIDEO selector on the TV to VIDEO.**

(N-1)



Playing Back a Tape

Turn on the TV, and select the channel for viewing a playback picture (set the TV/VIDEO selector to VIDEO). Of course, you can monitor the playback picture in the viewfinder at the same time.
(N-1)

1 **Set the POWER switch to PLAYER while pressing the green button.**

2 **Insert a cassette.**

3 **Press ▷.**
Playback starts.

To view the still picture (playback pause), press **II** PAUSE during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or **II**.

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

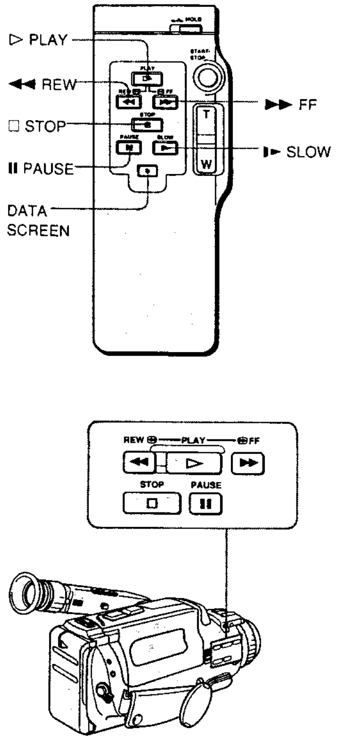
To rewind the tape, press ◀◀.

To advance the tape rapidly, press ▶▶.

To stop playback, press □.

To stop the tape momentarily, press **II**.

(N-2)



Monitoring a High-Speed Picture

(N-2)

To locate the desired scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⊕ or ⊕ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)
Press ◀◀ while rewinding or ▶▶ while advancing the tape rapidly. ⊕ or ⊕ appears in the viewfinder.
To resume normal playback, press ▷.

Monitoring a Slow-Speed Picture

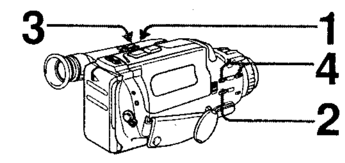
To view the picture at 1/5 speed (slow playback, only on the Commander),
press I▶ during playback.
I▶ appears in the viewfinder.
To resume normal playback, press ▷.

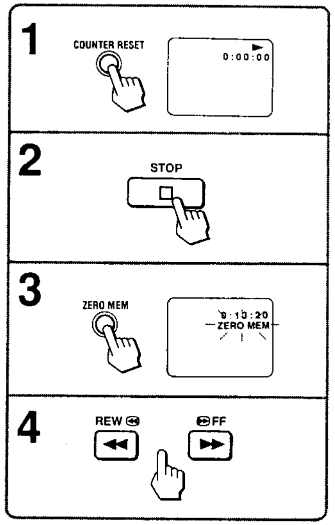
Note
When slow playback lasts for 1 minute or more, playback at the normal speed starts automatically.

Displaying the Viewfinder Screen Indicators on the TV

Press DATA SCREEN on the Commander.
The indicators on the viewfinder screen appear on the TV.
To erase the indicators, press DATA SCREEN again.

(O)





Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

Counting the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00".

To Return to a Pre-registered Point

(O)

1 **During playback, press COUNTER RESET at the point you later want to locate.**
The counter shows "0:00:00".

2 **Press □ when the playback has finished, as usual.**

3 **Press ZERO MEM.**
The "ZERO MEM" indicator flashes in the viewfinder.

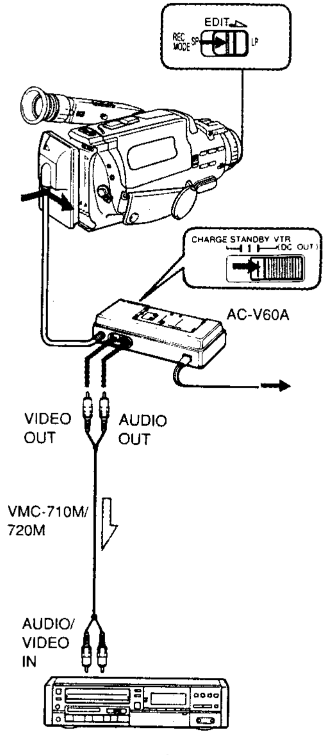
Note
Be sure to press ZERO MEM after you stop the tape. It does not function during playback.

4 **Press ◀◀ or ▶▶.**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button

- Something must be recorded on the tape in order for the tape counter to function. Tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.

(P)



: Signal flow

Editing onto Another VTR

You can create your own video program by editing with any other 8 8-mm, β Betamax or VHS VHS format VTR.

Before You Begin

(P)

- Make connections using an appropriate A/V connecting cable according to the connector type of your VTR.
  Sony offers you the following cables (not supplied).
  [a] VMC-710M/720M: for monaural type VTR
  [b] VMC-910MS/920MS: for stereo VTR
- Set the input selector of the VTR to LINE, if available.

Operation

1 Insert a cassette to be recorded on into the recording VTR.
2 Set the EDIT switch on the camcorder to the direction of the arrow (EDIT ON).
3 Set the CHARGE/VTR switch on the AC power adaptor to VTR.
4 Set the POWER switch of the camcorder to PLAYER and insert your recorded cassette.
5 Play back on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
6 On the recording VTR, locate the recording starting point and set the VTR to the recording pause mode.
7 Press **II** of the VTR and camcorder simultaneously to start editing.

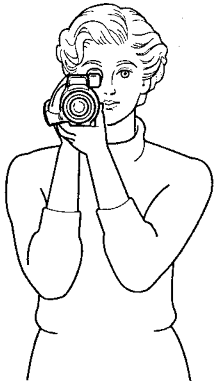
To stop editing momentarily, press **II** on the recording VTR.

To edit more scenes, repeat steps 5 to 7.

To stop editing, press □ on the VTR and camcorder.

Use of the EDIT switch
When you set the EDIT switch to the direction of the arrow (EDIT ON), picture deterioration resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

(Q)



For Your Information

Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting (Q)
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Note
When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm. Otherwise, the screw may damage the inner parts of the camcorder.

Keep the horizontal plane level
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

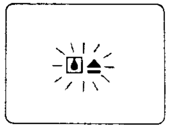
Lighting

Shoot with the sun behind you
When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

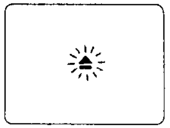
- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background.
  In this case, the face will be recorded too dark.

Use video light (not supplied) in the dark
To get the best colours, you must maintain a very high lighting level. When using a video light, attach it to this camcorder with a video light attachment (not supplied).

(R-1)



(R-2)



Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

1 Be sure to tightly seal the plastic bag containing the camcorder.
2 Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

If moisture condenses inside the unit (R-1)
Moisture is present inside the camcorder when:

- the ▣ indicator in the viewfinder flashes.
  When the cassette is inserted, the ⏏ indicator also flashes.
- beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for cassette ejection will work.
Eject the cassette, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the ▣ indicator does not appear when the power is turned on again.

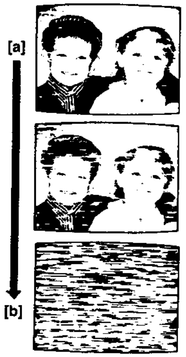
If moisture condenses on the surface of the tape (R-2)
Moisture is present on the surface of the tape when:

- The ⏏ indicator flashes in the viewfinder when the cassette is inserted and a tape transport button (▷, ◀◀ etc.) is pressed.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

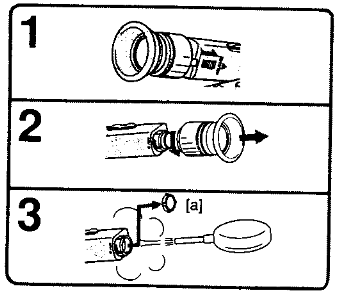
In such cases, no function except for cassette ejection will work.
Eject the cassette and let it sit for at least 1 hour.
The cassette can be used again if the ⏏ indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condenses on the lens
No caution indicators will appear, but the picture becomes dim.
Turn off the power and leave the camcorder unused for at least 1 hour.

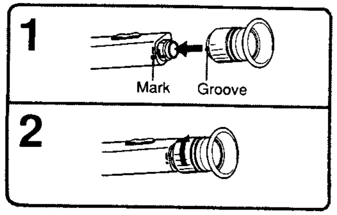
(R-3)



(R-4)



(R-5)



Notes on Video Head Cleaning

(R-3)

To ensure clear picture, clean the video heads periodically.
When playback pictures are noisy or hardly visible, the video heads may be contaminated.
[a] Slight contamination
[b] Critical contamination
In such cases,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Viewfinder Cleaning

(R-4)

1 **Pull the switch on the viewfinder barrel down.**

2 **Turn the eyecup in the direction of the arrow and detach the eyecup.**

3 **Clean the surface of the screen with a commercially available blower.**
The small lens in the viewfinder can be removed. [a]

To reattach the eyecup (R-5)
1 Align the groove on the eyecup with the ● mark on the barrel.
2 Turn the eyecup in the reverse direction of the arrow.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.**
- **Do not let the camcorder get wet. Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.**

On care

- When the unit will not be used for a long time, periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Using your Camcorder Abroad

Each country has its own electricity system and TV colour system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Differences in colour systems

This camcorder is a PAL system based camcorder. If you want to view the playback picture on a TV, it must be a PAL system based TV or a SECAM system based TV with PAL-SECAM transcoder. Check the following alphabetical list.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (Former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

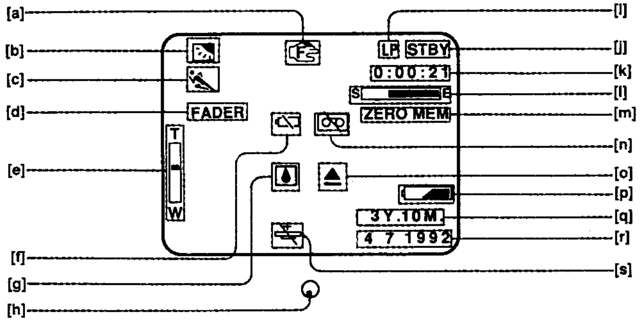
PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

Indicators in the Viewfinder

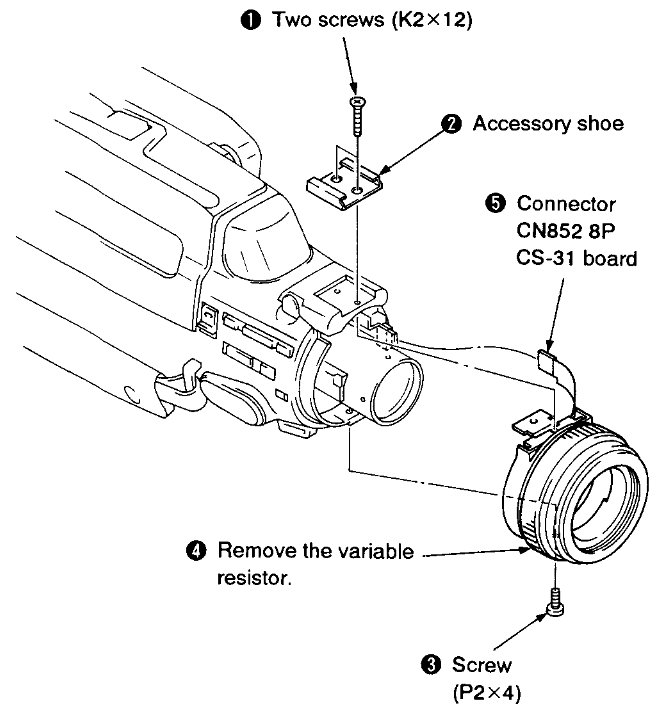

[a]
[b]
[c]
[d]
FADER
[e]
T
W
[f]
[g]
[h]
[i]
LP STBY
[j]
0:00:21
[k]
S
E
[l]
ZERO MEM
[m]
[n]
[o]
[p]
3Y.10M
[q]
4 7 1992
[r]
[s]

[a] Manual focusing (□)
[b] BACK LIGHT is pressed. (□)
[c] PROGRAM AE setting (□, □, □)
[d] FADER is pressed.
[e] Power zoom indicator
[f] "Exchange battery." (□)
[g] Moisture has condensed. (□)
[h] Lights up during recording.
When flashing:"Exchange battery or cassette."

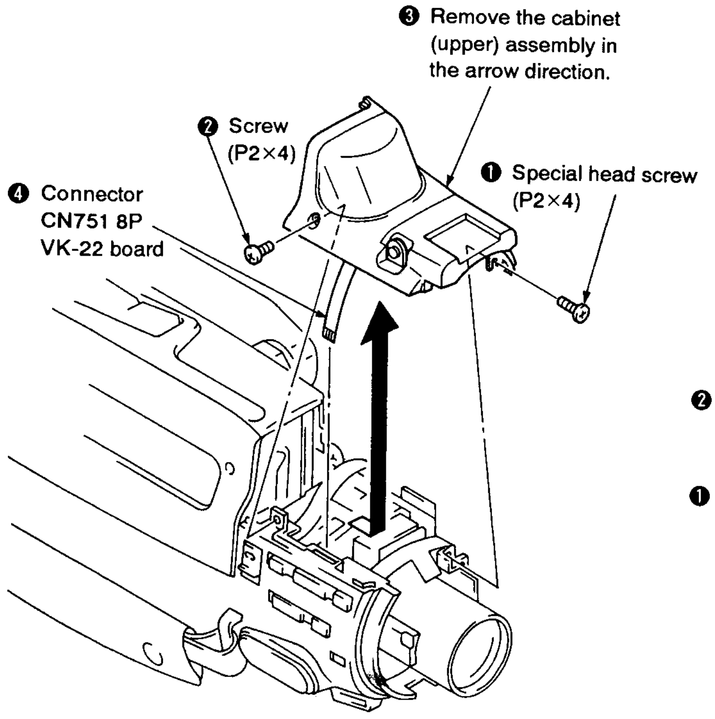
[i] Recording or playback mode (LP,SP)
[j] Tape transport mode
[k] Tape counter
[l] Remaining time of tape
[m] ZERO MEM is pressed.
[n] "Exchange cassette or no cassette inside." (□)
[0] "Trouble has occurred" (▲) "Clean video heads." (●)
[p] Remaining capacity of a battery
[q] Age
[r] Date or Time
[s] "Replace lithium battery" (□)

SECTION 2
DISASSEMBLY

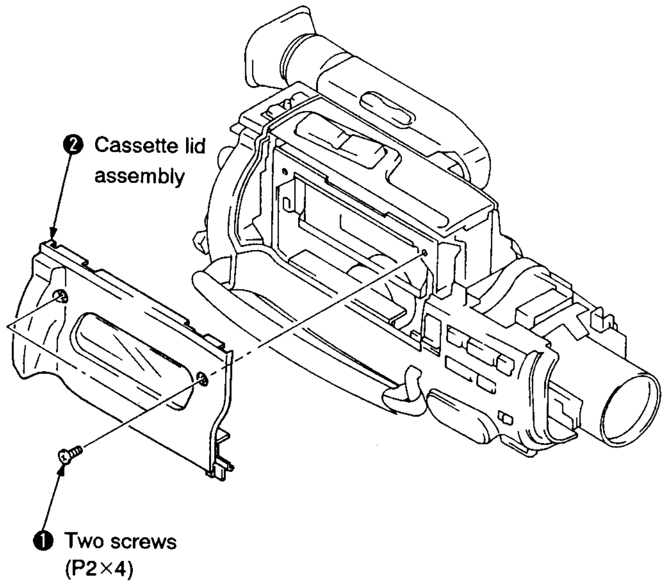
2-1. REMOVAL OF VARIABLE RESISTOR


① Two screws (K2×12)
② Accessory shoe
⑤ Connector
CN852 8P
CS-31 board
④ Remove the variable resistor.
③ Screw
(P2×4)

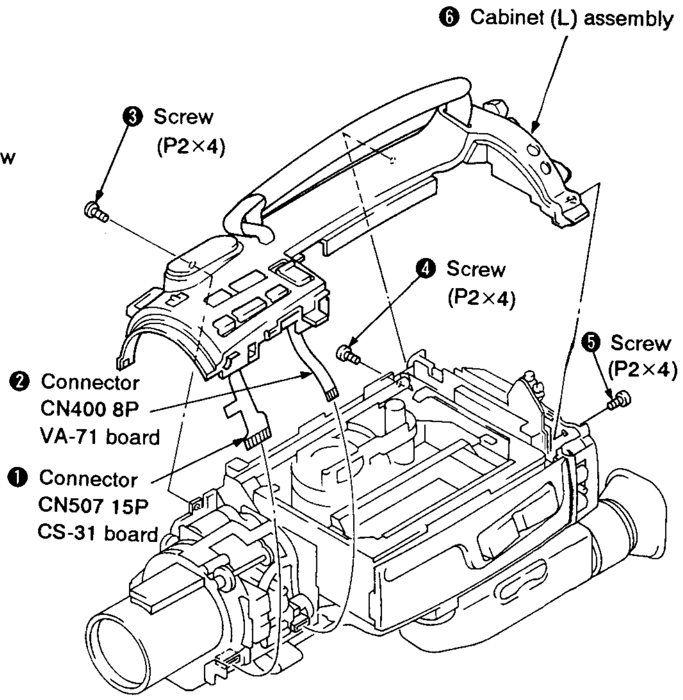
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY


③ Remove the cabinet (upper) assembly in the arrow direction.
② Screw
(P2×4)
④ Connector
CN751 8P
VK-22 board
① Special head screw
(P2×4)

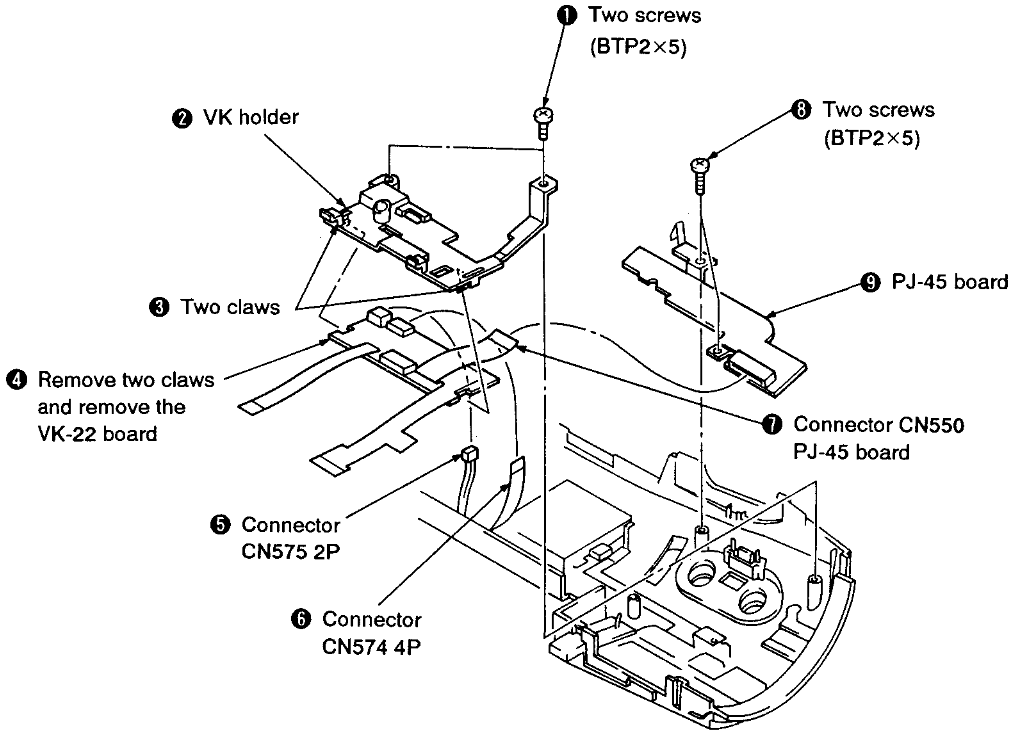
2-3. REMOVAL OF CASSETTE LID ASSEMBLY


② Cassette lid assembly
① Two screws
(P2×4)

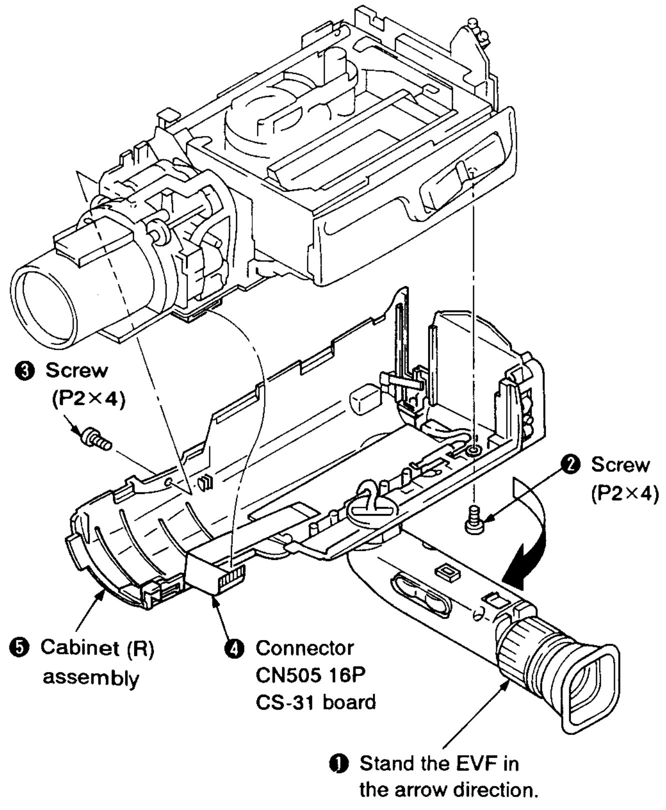
2-4. REMOVAL OF CABINET (L) ASSEMBLY


⑥ Cabinet (L) assembly
③ Screw
(P2×4)
④ Screw
(P2×4)
⑤ Screw
(P2×4)
② Connector
CN400 8P
VA-71 board
① Connector
CN507 15P
CS-31 board

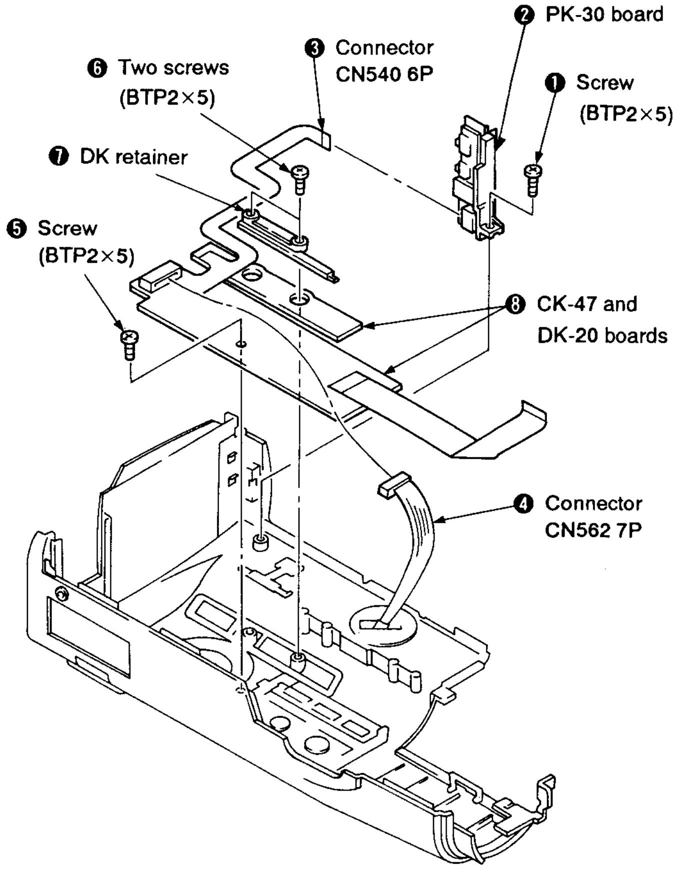
2-5. REMOVAL OF VK-22 AND PJ-45 BOARDS


❶ Two screws (BTP2×5)
❷ VK holder
❸ Two claws
❹ Remove two claws and remove the VK-22 board
❺ Connector CN575 2P
❻ Connector CN574 4P
❼ Connector CN550 PJ-45 board
❽ Two screws (BTP2×5)
❾ PJ-45 board

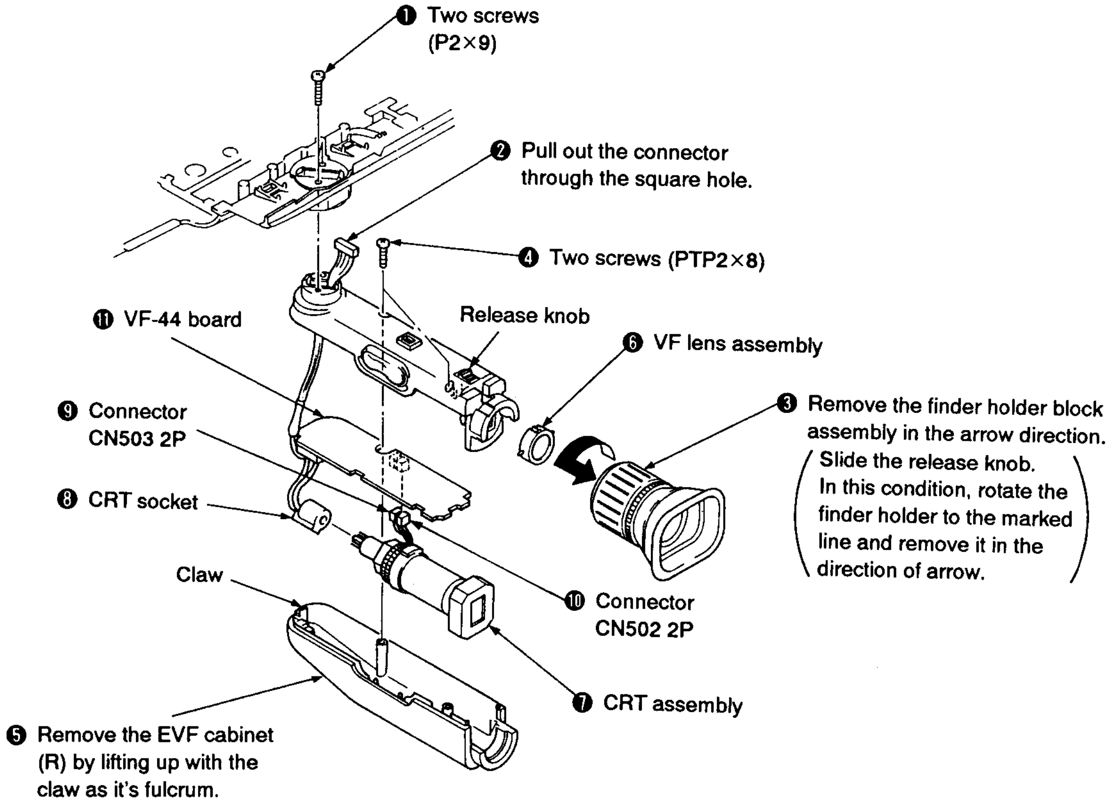
2-6. REMOVAL OF CABINET (R) ASSEMBLY


❶ Stand the EVF in the arrow direction.
❷ Screw (P2×4)
❸ Screw (P2×4)
❹ Connector CN505 16P CS-31 board
❺ Cabinet (R) assembly

2-7. REMOVAL OF CK-47, DK-20 AND PK-30 BOARDS


❶ Screw (BTP2×5)
❷ PK-30 board
❸ Connector CN540 6P
❹ Connector CN562 7P
❺ Screw (BTP2×5)
❻ Two screws (BTP2×5)
❼ DK retainer
❽ CK-47 and DK-20 boards

2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)



① Two screws (P2×9)

② Pull out the connector through the square hole.

③ Remove the finder holder block assembly in the arrow direction.
(Slide the release knob. In this condition, rotate the finder holder to the marked line and remove it in the direction of arrow.)

④ Two screws (PTP2×8)

⑤ Remove the EVF cabinet (R) by lifting up with the claw as it's fulcrum.

⑥ VF lens assembly

⑦ CRT assembly

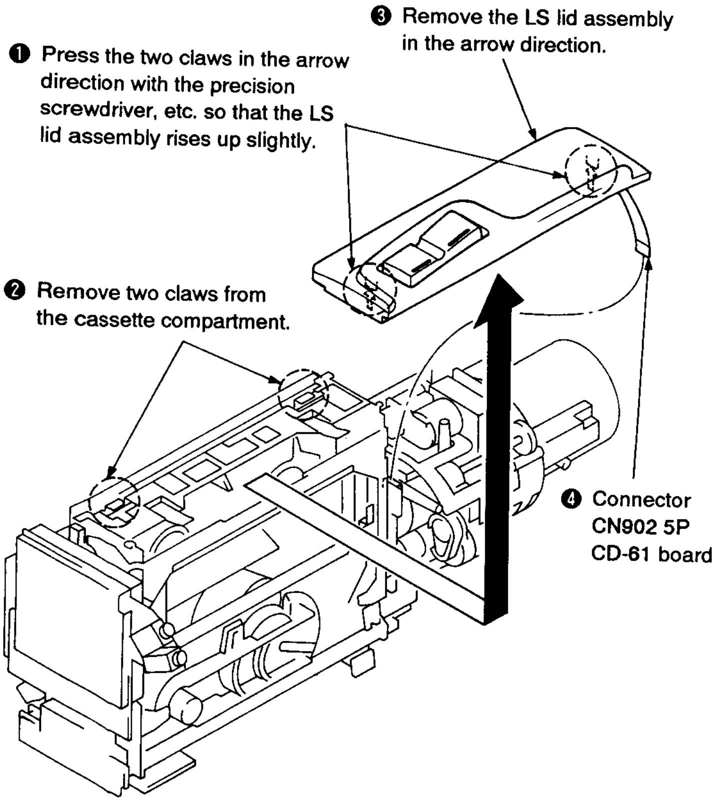
⑧ CRT socket

⑨ Connector CN503 2P

⑩ Connector CN502 2P

⑪ VF-44 board

2-9. REMOVAL OF LS LID ASSEMBLY



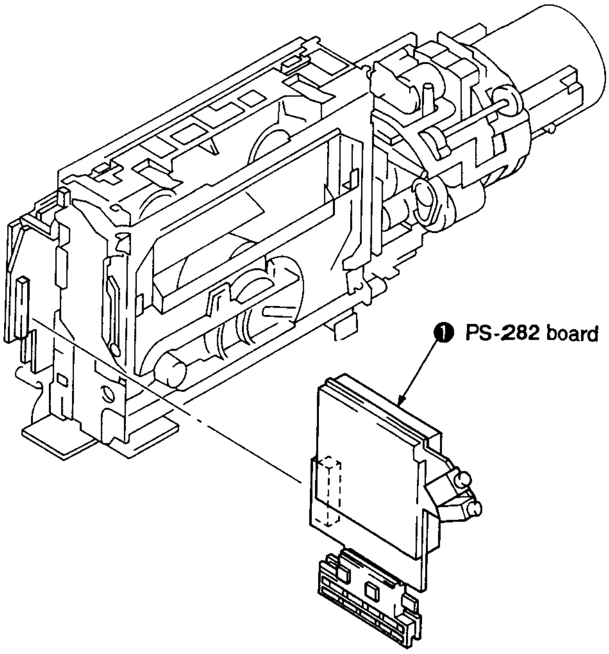
① Press the two claws in the arrow direction with the precision screwdriver, etc. so that the LS lid assembly rises up slightly.

② Remove two claws from the cassette compartment.

③ Remove the LS lid assembly in the arrow direction.

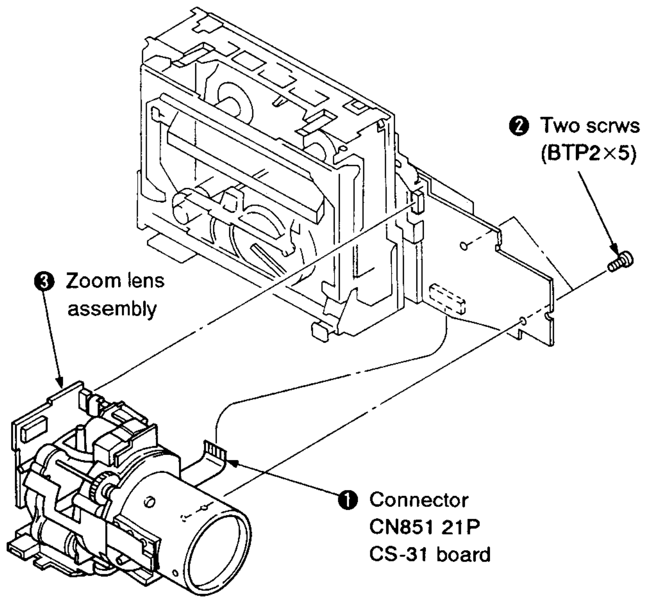
④ Connector CN902 5P CD-61 board

2-10. REMOVAL OF PS-282 BOARD

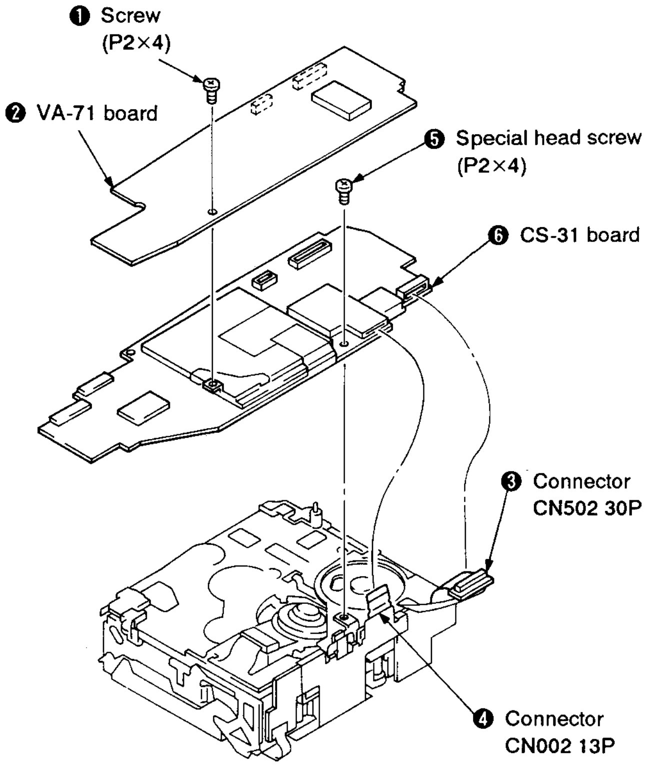


① PS-282 board

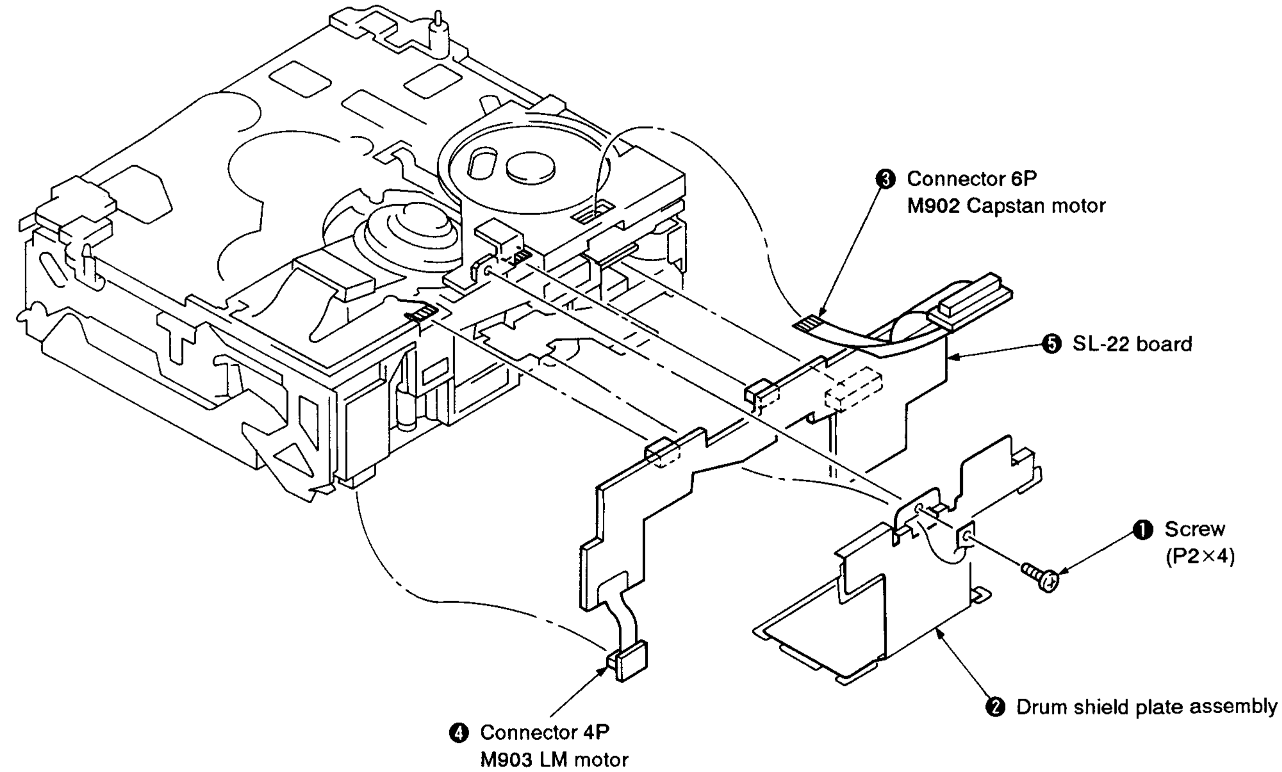
2-11. REMOVAL OF ZOOM LENS ASSEMBLY


❷ Two scrws
(BTP2×5)
❸ Zoom lens
assembly
❶ Connector
CN851 21P
CS-31 board

2-12. REMOVAL OF VA-71 AND CS-31 BOARDS

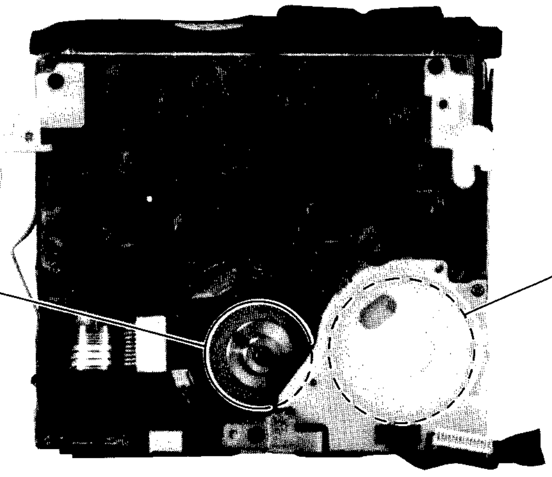

❶ Screw
(P2×4)
❷ VA-71 board
❺ Special head screw
(P2×4)
❻ CS-31 board
❸ Connector
CN502 30P
❹ Connector
CN002 13P

2-13. REMOVAL OF SL-22 BOARD


❸ Connector 6P
M902 Capstan motor
❺ SL-22 board
❶ Screw
(P2×4)
❷ Drum shield plate assembly
❹ Connector 4P
M903 LM motor

2-14. INTERNAL VIEWS

— Right side —

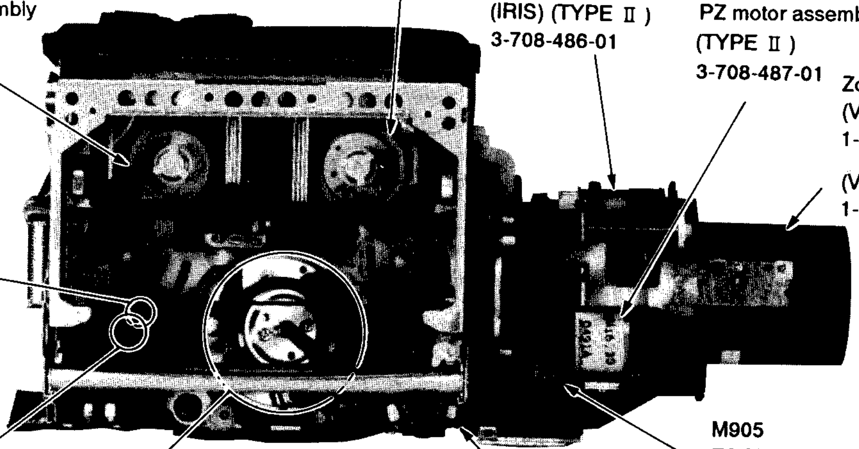


M901
Drum assembly
(DGH-90A-R)
A-7048-585-A

Upper drum assembly
(DGR-90-R)
A-7049-521-A

M902
Capstan motor
(SCE-0101A)
8-835-477-01

— Left side —



T reel table assembly
X-3941-274-1

S reel table assembly
X-3941-275-1

M904
IRIS assembly
(TYPE Ⅰ)
3-708-385-01

IG meter assembly
(IRIS) (TYPE Ⅱ)
3-708-486-01

M906
ZOOM motor assembly
(TYPE Ⅰ)
3-708-387-01

PZ motor assembly (ZOOM)
(TYPE Ⅱ)
3-708-487-01

Zoom lens assembly
(VCL-6110WA) (TYPE Ⅰ)
1-547-540-11

(VCL-6110WC) (TYPE Ⅱ)
1-547-561-21

Pinch roller

M902
Capstan motor
(SCE-0101A)
8-835-477-01

M901
Drum assembly (DGH-90A-R)
A-7048-585-A

Upper drum assembly (DGR-90-R)
A-7049-521-A

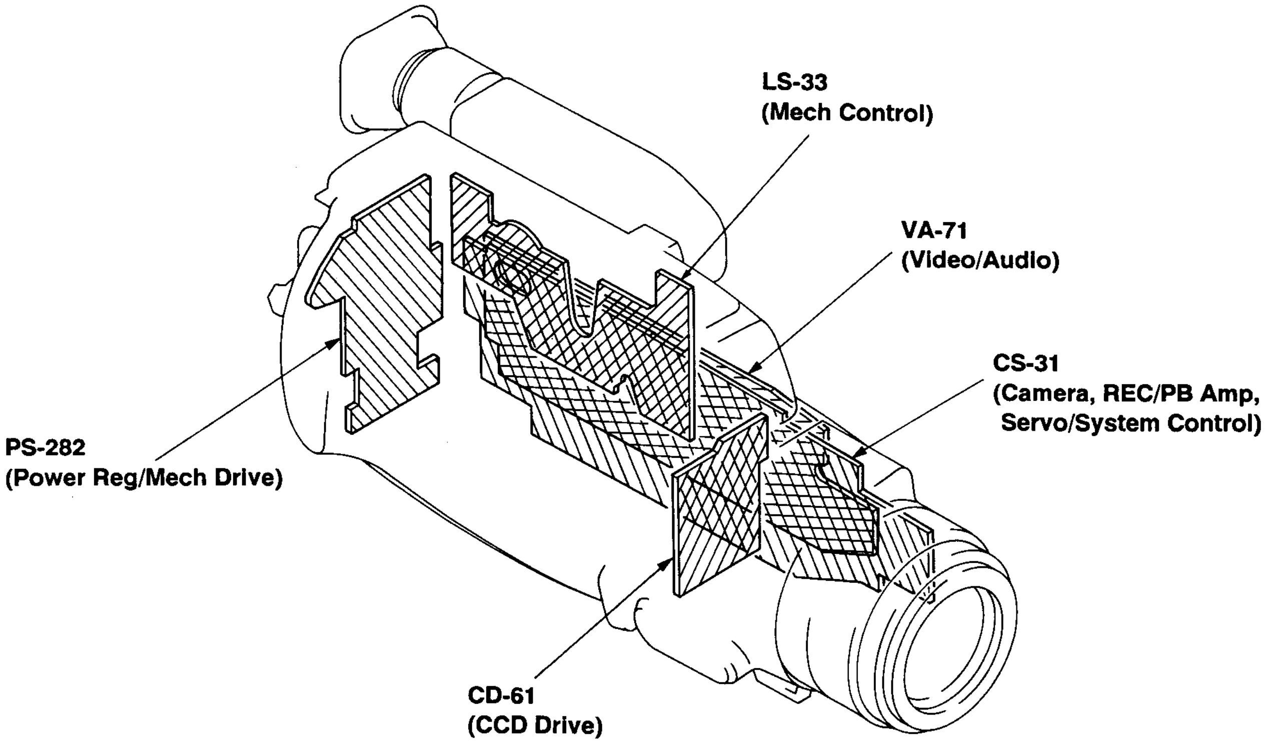
M903
Loading motor assembly
A-7040-304-A

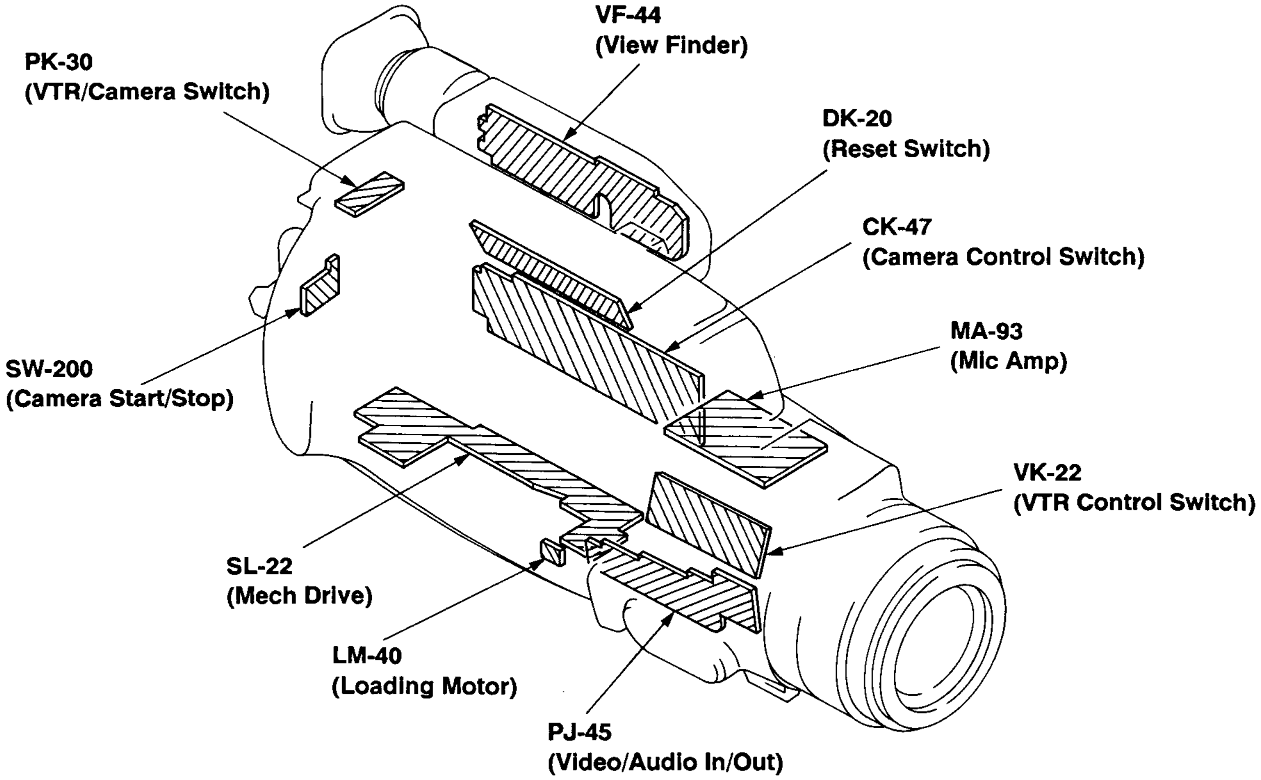
M905
FOCUS motor assembly (TYPE Ⅰ)
3-708-389-01

AF motor assembly (FOCUS) (TYPE Ⅱ)
3-708-489-01

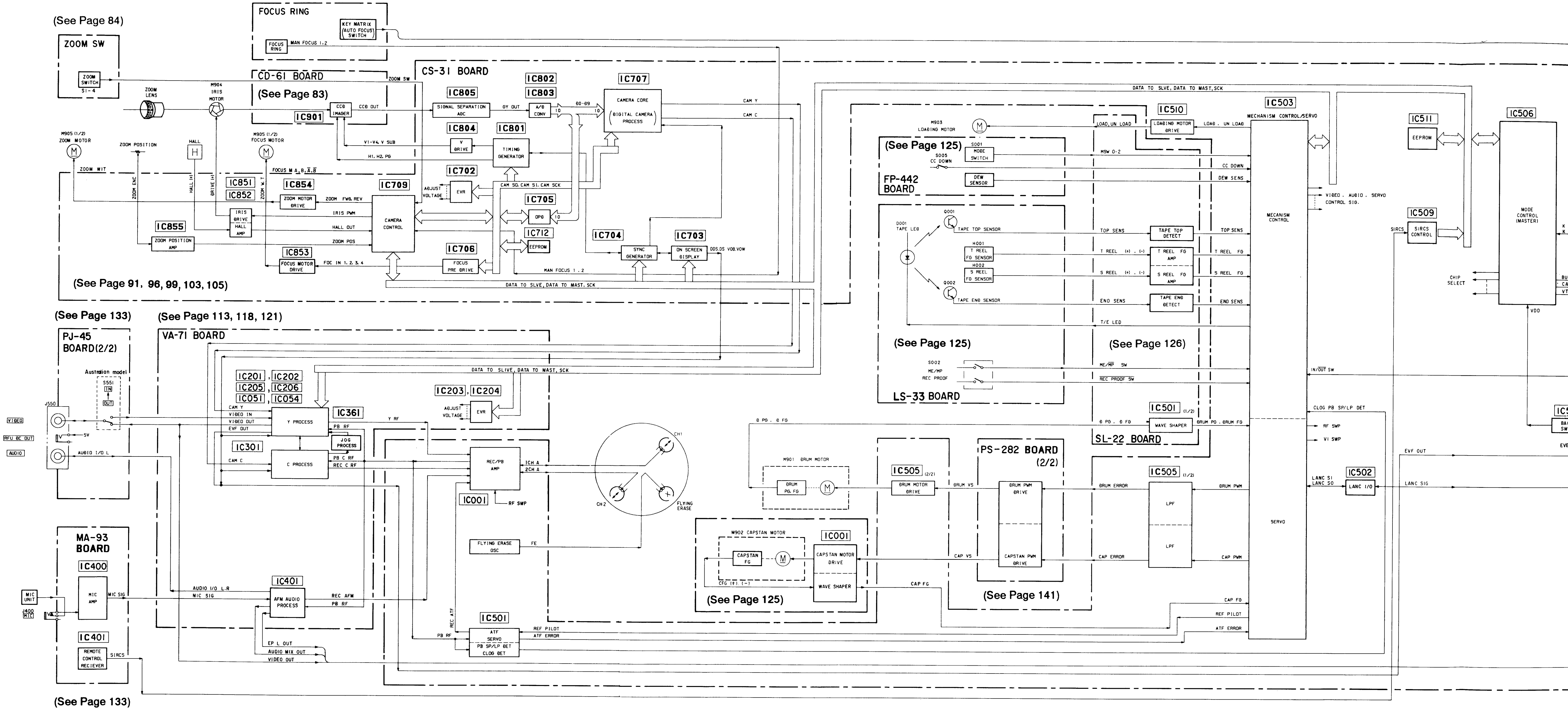
SECTION 3
DIAGRAMS

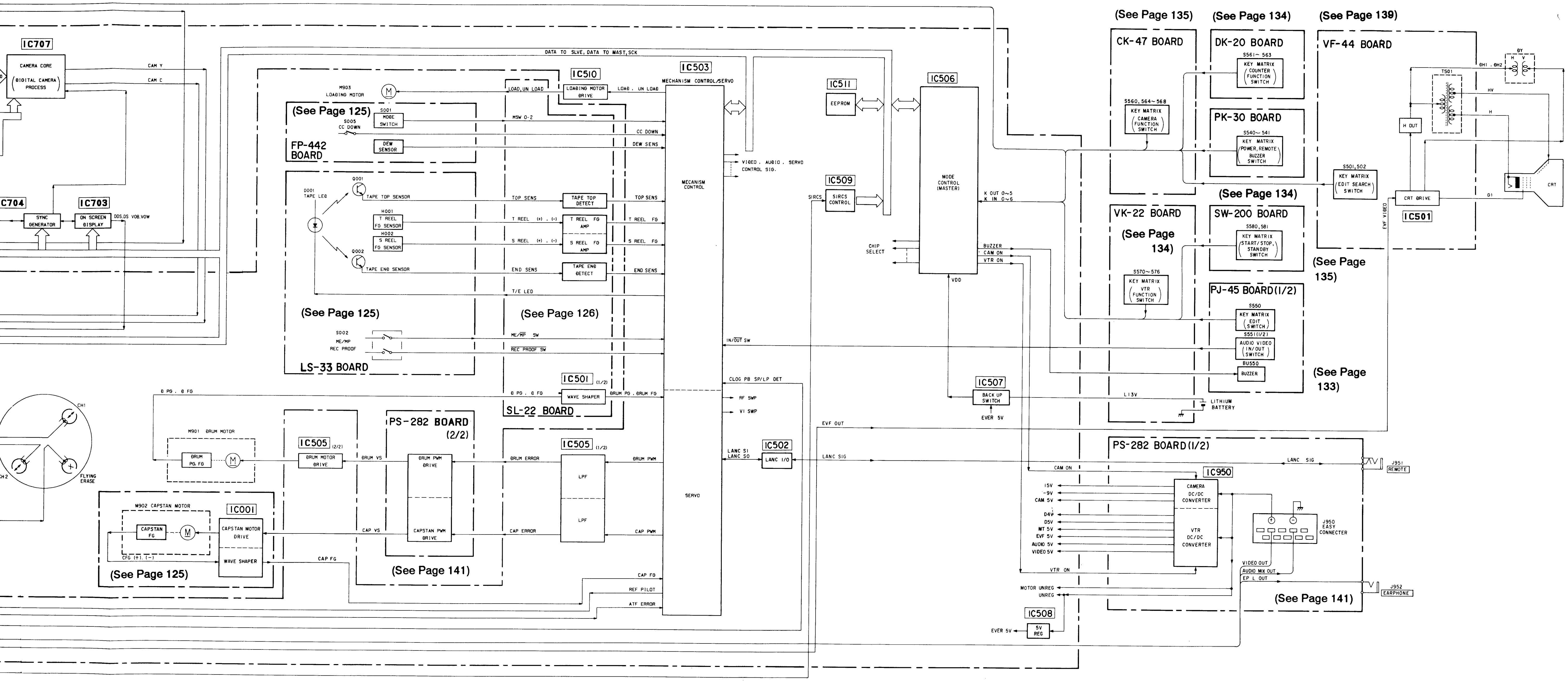
3-1. CIRCUIT BOARDS LOCATION


LS-33
(Mech Control)
VA-71
(Video/Audio)
CS-31
(Camera, REC/PB Amp, Servo/System Control)
PS-282
(Power Reg/Mech Drive)
CD-61
(CCD Drive)

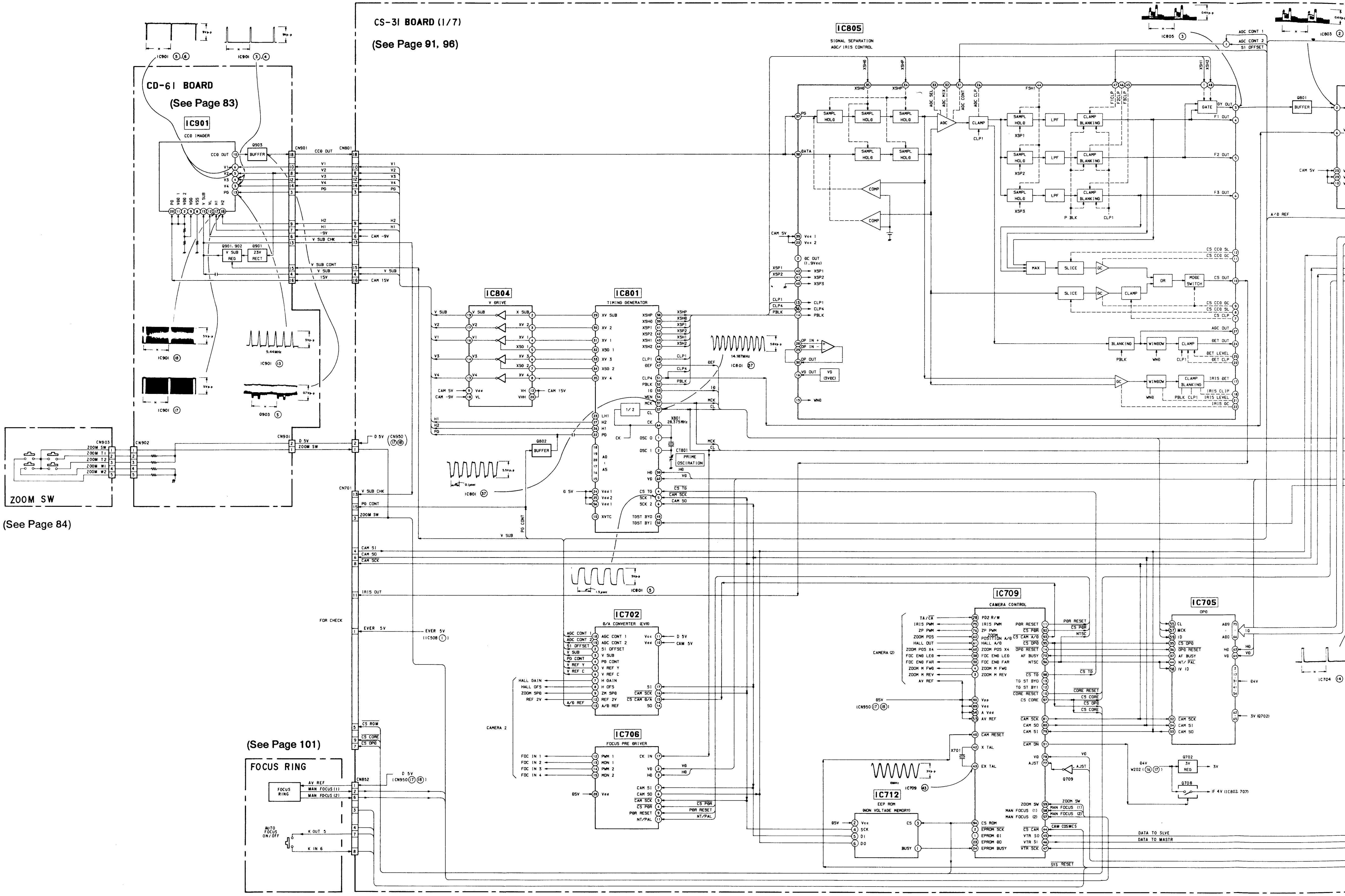

VF-44
(View Finder)
PK-30
(VTR/Camera Switch)
DK-20
(Reset Switch)
CK-47
(Camera Control Switch)
MA-93
(Mic Amp)
SW-200
(Camera Start/Stop)
VK-22
(VTR Control Switch)
SL-22
(Mech Drive)
LM-40
(Loading Motor)
PJ-45
(Video/Audio In/Out)

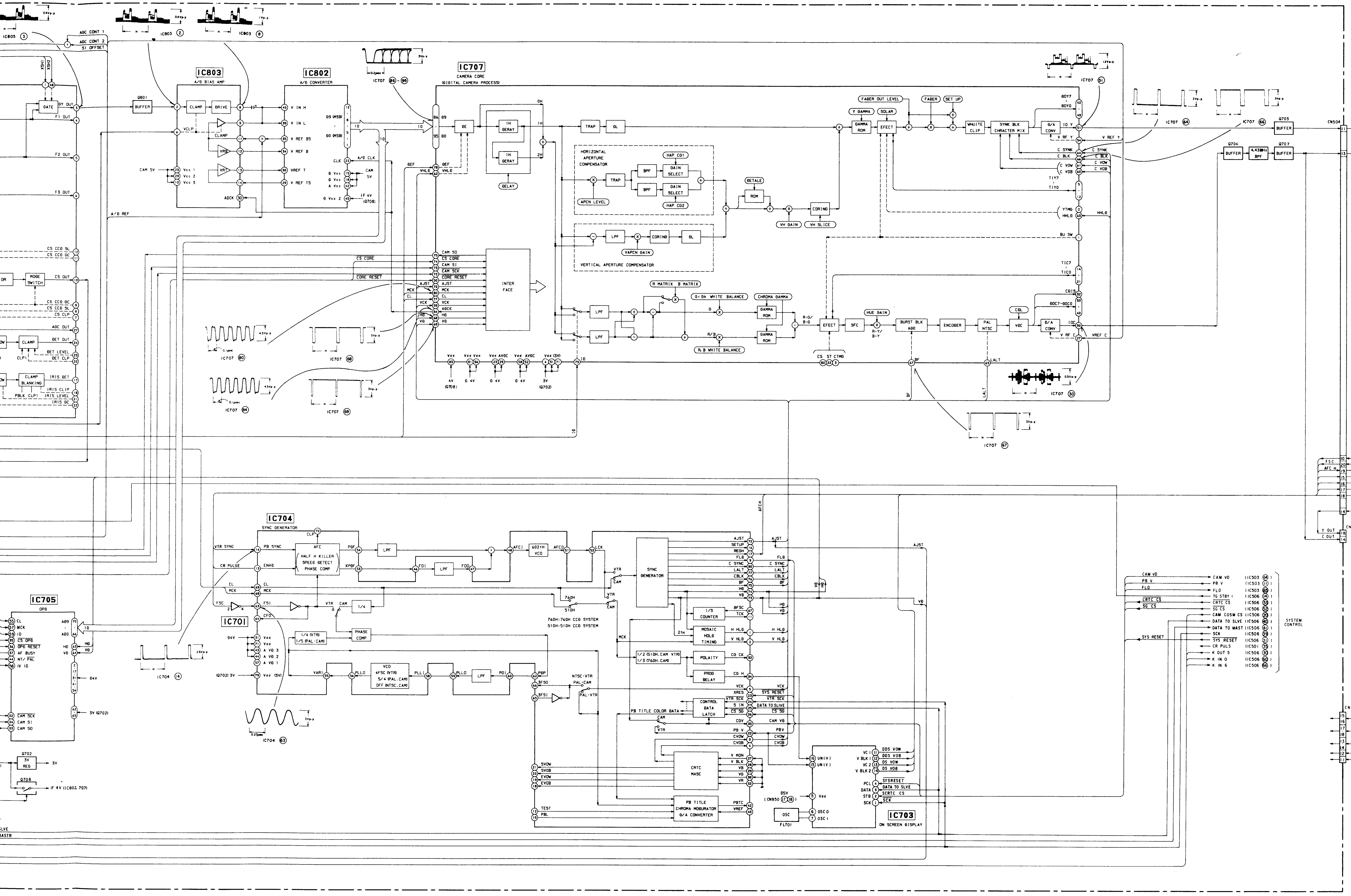
3-2. OVERALL BLOCK DIAGRAM


(See Page 84)
ZOOM SW
ZOOM SWITCH
S1-4
FOCUS RING
KEY MATRIX (AUTO FOCUS SWITCH)
FOCUS RING
MAN FOCUS 1,2
CD-61 BOARD
(See Page 83)
ZOOM SW
ZOOM LENS
M904 IRIS MOTOR
CCD IMAGER
CCD OUT
IC901
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
HALL
M905 (1/2) FOCUS MOTOR
V1-V4, V SUB
H1, H2, PG
ZOOM WIT
FOCUS M A, B, $\overline{A}$, $\overline{B}$
ZOOM ENC
HALL (+)
DRIVE (+)
ZOOM W, T
CS-31 BOARD
IC805
SIGNAL SEPARATION AGC
GY OUT
IC802
IC803
A/D CONV
D0-D9
10
IC707
CAMERA CORE (DIGITAL CAMERA PROCESS)
CAM Y
CAM C
IC804
V DRIVE
IC801
TIMING GENERATOR
IC702
ADJUST VOLTAGE
EVR
CAM SO, CAM SI, CAM SCK
IC851
IC852
IC854
ZOOM MOTOR DRIVE
ZOOM FWD, REV
IC709
CAMERA CONTROL
IRIS PWM
IRIS DRIVE
HALL AMP
HALL OUT
IC855
ZOOM POSITION AMP
ZOOM POS
IC853
FOCUS MOTOR DRIVE
FOC IN 1, 2, 3, 4
IC705
OPD
IC712
EEPROM
IC706
FOCUS PRE DRIVE
MAN FOCUS 1, 2
IC704
SYNC GENERATOR
IC703
ON SCREEN DISPLAY
DDS.DS VOB.VOW
DATA TO SLVE, DATA TO MAST, SCK
(See Page 91, 96, 99, 103, 105)
(See Page 133)
PJ-45 BOARD(2/2)
Australian model
S551
IN
OUT
J550
VIDEO
RFU DC OUT
AUDIO
5V
AUDIO I/O L
(See Page 113, 118, 121)
VA-71 BOARD
DATA TO SLIVE, DATA TO MAST, SCK
IC201, IC202
IC205, IC206
IC051, IC054
CAM Y
VIDEO IN
VIDEO OUT
EVF OUT
Y PROCESS
IC361
Y RF
PB RF
JOG PROCESS
IC301
CAM C
C PROCESS
PB C RF
REC C RF
IC203, IC204
ADJUST VOLTAGE
EVR
REC/PB AMP
1CH A
2CH A
IC001
RF SWP
CH1
CH2
FLYING ERASE
FLYING ERASE OSC
FE
MA-93 BOARD
IC400
MIC UNIT
J400 MIC
MIC AMP
MIC SIG
IC401
REMOTE CONTROL RECIEVER
SIRCS
(See Page 133)
AUDIO I/O L.R
MIC SIG
IC401
AFM AUDIO PROCESS
REC AFM
PB RF
EP L OUT
AUDIO MIX OUT
VIDEO OUT
REC ATF
PB RF
IC501
ATF SERVO
PB SP/LP DET
CLOG DET
REF PILOT
ATF ERROR
D PG, D FG
M901 DRUM MOTOR
DRUM PG, FG
M902 CAPSTAN MOTOR
CAPSTAN FG
CFG (+), (−)
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
CAP FG
(See Page 125)
IC505 (2/2)
DRUM MOTOR DRIVE
DRUM VS
CAP VS
PS-282 BOARD (2/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
(See Page 141)
DATA TO SLVE, DATA TO MAST, SCK
M903 LOADING MOTOR
(See Page 125)
S001 MODE SWITCH
S005 CC DOWN
FP-442 BOARD
DEW SENSOR
Q001
D001 TAPE LED
TAPE TOP SENSOR
H001 T REEL FG SENSOR
H002 S REEL FG SENSOR
Q002
TAPE END SENSOR
(See Page 125)
S002 ME/MP REC PROOF
LS-33 BOARD
LOAD, UN LOAD
IC510
LOADING MOTOR DRIVE
LOAD, UN LOAD
MSW 0-2
CC DOWN
DEW SENS
TOP SENS
TAPE TOP DETECT
T REEL (+), (−)
T REEL FG AMP
S REEL (+), (−)
S REEL FG AMP
END SENS
TAPE END DETECT
T/E LED
(See Page 126)
ME/$\overline{MP}$ SW
$\overline{REC\ PROOF}$ SW
IC501 (1/2)
D PG, D FG
WAVE SHAPER
DRUM PG, DRUM FG
SL-22 BOARD
IC505 (1/2)
DRUM ERROR
LPF
DRUM PWM
CAP ERROR
LPF
CAP PWM
IC503
MECHANISM CONTROL/SERVO
MECANISM CONTROL
SERVO
TOP SENS
T REEL FG
S REEL FG
END SENS
CAP FG
REF PILOT
ATF ERROR
VIDEO, AUDIO, SERVO CONTROL SIG.
IN/$\overline{OUT}$ SW
CLOG PB SP/LP DET
RF SWP
V1 SWP
LANC SI
LANC SO
IC502
LANC I/O
LANC SIG
EVF OUT
IC511
EEPROM
IC509
SIRCS
SIRCS CONTROL
IC506
MODE CONTROL (MASTER)
CHIP SELECT
VDD


IC707
CAMERA CORE
(DIGITAL CAMERA PROCESS)
CAM Y
CAM C
C704
SYNC GENERATOR
IC703
ON SCREEN DISPLAY
DDS.DS VDB.VDW
DATA TO SLVE, DATA TO MAST, SCK
IC510
LOADING MOTOR DRIVE
M903
LOADING MOTOR
LOAD, UN LOAD
LOAD . UN LOAD
IC503
MECHANISM CONTROL/SERVO
MECANISM CONTROL
SERVO
(See Page 125)
S001
MODE SWITCH
S005
CC DOWN
DEW SENSOR
FP-442 BOARD
MSW 0-2
CC DOWN
DEW SENS
D001
TAPE LED
Q001
TAPE TOP SENSOR
H001
T REEL FG SENSOR
H002
S REEL FG SENSOR
Q002
TAPE END SENSOR
TOP SENS
T REEL (+) . (-)
S REEL (+) . (-)
END SENS
T/E LED
TAPE TOP DETECT
T REEL FG AMP
S REEL FG AMP
TAPE END DETECT
T REEL FG
S REEL FG
(See Page 125)
(See Page 126)
S002
ME/MP
REC PROOF
ME/MP SW
REC PROOF SW
LS-33 BOARD
IC501 (1/2)
WAVE SHAPER
D PG . D FG
DRUM PG . DRUM FG
SL-22 BOARD
CH1
CH2
FLYING ERASE
M901 DRUM MOTOR
DRUM PG, FG
IC505 (2/2)
DRUM MOTOR DRIVE
DRUM VS
PS-282 BOARD (2/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
(See Page 141)
DRUM ERROR
CAP ERROR
IC505 (1/2)
LPF
LPF
DRUM PWM
CAP PWM
M902 CAPSTAN MOTOR
CAPSTAN FG
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
CFG (+). (-)
CAP VS
CAP FG
(See Page 125)
CAP FG
REF PILOT
ATF ERROR
VIDEO . AUDIO . SERVO CONTROL SIG.
IN/OUT SW
CLOG PB SP/LP DET
RF SWP
VI SWP
EVF OUT
LANC SI
LANC SO
IC502
LANC I/O
LANC SIG
IC511
EEPROM
IC509
SIRCS
SIRCS CONTROL
IC506
MODE CONTROL (MASTER)
K OUT 0~5
K IN 0~6
CHIP SELECT
BUZZER
CAM ON
VTR ON
VDD
IC507
BACK UP SWITCH
EVER 5V
L13V
LITHIUM BATTERY
(See Page 135)
CK-47 BOARD
S560, 564~568
KEY MATRIX (CAMERA FUNCTION SWITCH)
(See Page 134)
DK-20 BOARD
S561~563
KEY MATRIX (COUNTER FUNCTION SWITCH)
PK-30 BOARD
S540~541
KEY MATRIX (POWER, REMOTE BUZZER SWITCH)
(See Page 134)
VK-22 BOARD
(See Page 134)
S570~576
KEY MATRIX (VTR FUNCTION SWITCH)
SW-200 BOARD
S580, 581
KEY MATRIX (START/STOP, STANDBY SWITCH)
PJ-45 BOARD (1/2)
S550
KEY MATRIX (EDIT SWITCH)
S551 (1/2)
AUDIO VIDEO (IN/OUT SWITCH)
BU550
BUZZER
(See Page 133)
(See Page 139)
VF-44 BOARD
S501, 502
KEY MATRIX (EDIT SEARCH SWITCH)
(See Page 135)
IC501
CRT DRIVE
EVF VIDEO
H OUT
T501
DY
H V
DH1 . DH2
HV
H
G1
CRT
PS-282 BOARD (1/2)
CAM ON
IC950
CAMERA DC/DC CONVERTER
VTR DC/DC CONVERTER
15V
-9V
CAM 5V
D4V
D5V
MT 5V
EVF 5V
AUDIO 5V
VIDEO 5V
VTR ON
MOTOR UNREG
UNREG
IC508
5V REG
EVER 5V
J950
EASY CONNECTER
VIDEO OUT
AUDIO MIX OUT
EP L OUT
LANC SIG
J951
REMOTE
J952
EARPHONE
(See Page 141)

3-3. CAMERA (1) BLOCK DIAGRAM


CS-31 BOARD (1/7)
(See Page 91, 96)
CD-61 BOARD
(See Page 83)
IC901
CCD IMAGER
Q903
BUFFER
CN901
CN801
CCD OUT
Q901, 902
V SUB REG
Q901
23V RECT
CN903
CN902
ZOOM SW
(See Page 84)
IC804
V DRIVE
IC801
TIMING GENERATOR
Q802
BUFFER
X801
28.375MHz
CT801
PRIME OSCIRATION
IC805
SIGNAL SEPARATION
AGC/IRIS CONTROL
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
COMP
GATE
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
Q801
BUFFER
IC702
D/A CONVERTER (EVR)
IC706
FOCUS PRE DRIVER
IC709
CAMERA CONTROL
IC712
EEP ROM
(NON VOLTAGE MEMORY)
IC705
OPC
Q702
3V REG
Q708
Q709
X701
CN701
CN852
FOCUS RING
(See Page 101)
FOCUS RING
AUTO FOCUS ON/OFF
CAMERA (2)
CAMERA 2
FOR CHECK
EVER 5V
DATA TO SLVE
DATA TO MASTR
SYS RESET
IC901 ⑤⑥
IC901 ③④
IC901 ⑱
IC901 ⑬
9.44MHz
IC901 ⑰
Q903 ⑤
IC801 ㉗
14.187MHz
IC801 ⑤
IC709 ㊸
IC805 ③
IC803 ②
IC704 ⑳

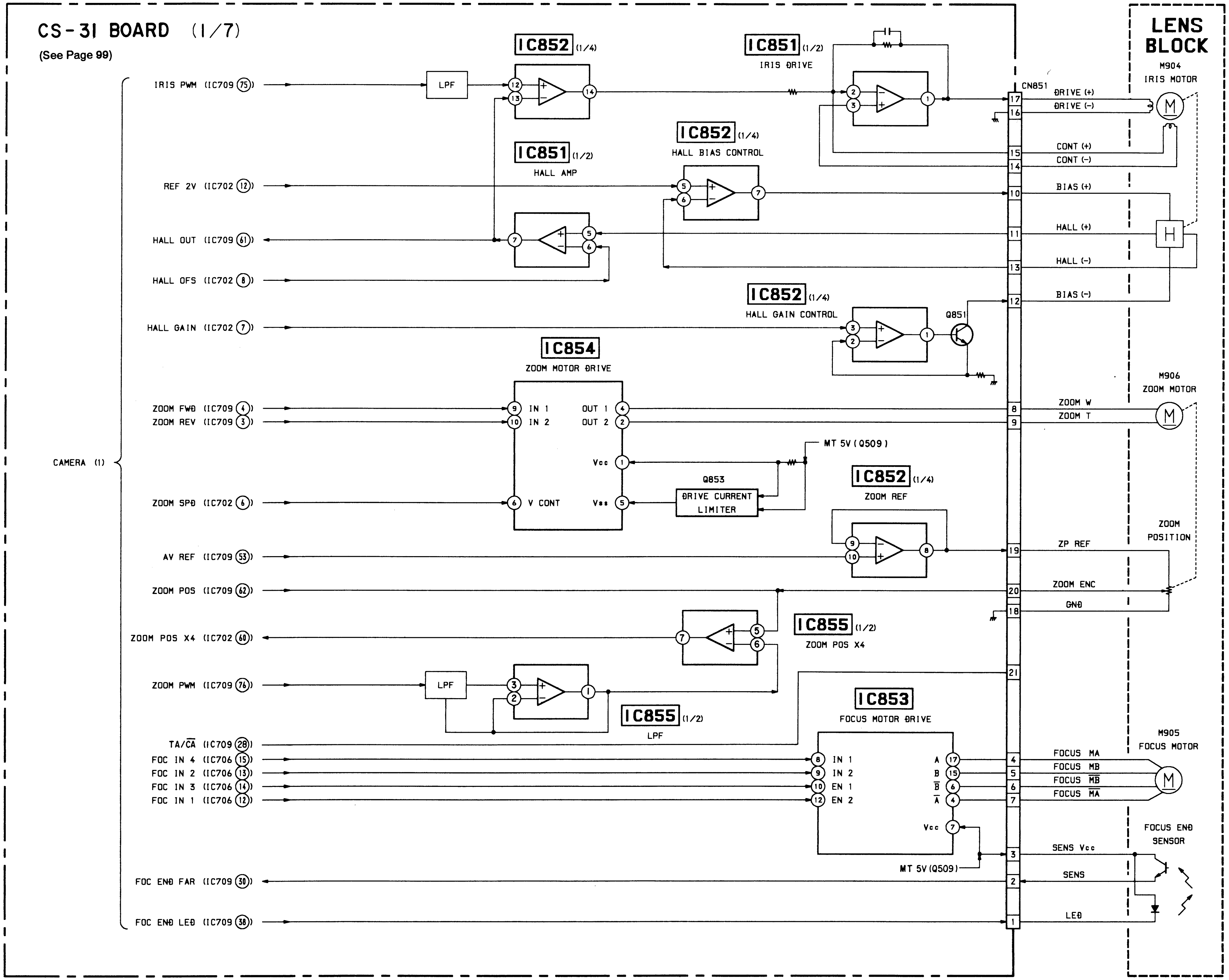

IC803
A/D BIAS AMP
IC802
A/D CONVERTER
IC707
CAMERA CORE
(DIGITAL CAMERA PROCESS)
IC704
SYNC GENERATOR
IC705
DPD
IC701
IC703
ON SCREEN DISPLAY
Q801 BUFFER
CLAMP
DRIVE
GATE
MODE SWITCH
CLAMP BLANKING
HORIZONTAL APERTURE COMPENSATOR
VERTICAL APERTURE COMPENSATOR
APCN LEVEL
HAP CO1
HAP CO2
GAIN SELECT
BPF
TRAP
DETALE
ROM
CORING
VH GAIN
VH SLICE
VAPCN GAIN
1H DELAY
DELAY
INTER FACE
R MATRIX B MATRIX
Cr/Cb WHITE BALANCE
R/B WHITE BALANCE
CHROMA GAMMA
GAMMA ROM
HUE GAIN
EFECT
SFC
BURST BLK ADD
ENCODER
PAL NTSC
COL
D/A CONV
FADER OUT LEVEL
FADER
SET UP
Y GAMMA
SOLAR
WHITE CLIP
SYNK BLK CHRACTER MIX
Q703 BUFFER
Q704 BUFFER
4.43MHz BPF
Q707 BUFFER
CN504
CAM Y
CAM C
VIDEO (1) (VA-71)
VTR SYNC
CAM FSC
AFC H
DDS VOW
DDS VOB
DS VOW
DS VOB
Y CHK
CN701
Y OUT
C OUT
FOR CHECK
HALF H KILLER SPEED DETECT PHASE COMP
LPF
602fH VCO
SYNC GENERATOR
1/3 COUNTER
MOSAIC HOLD TIMING
POLARITY
PROD DELAY
CONTROL DATA LATCH
CRTC MASC
PB TITLE CHROMA MODURATOR D/A CONVERTER
1/4
PHASE COMP
1/4 (VTR) 1/5 (PAL-CAM)
VCO 4FSC (VTR) 5/4 (PAL-CAM) OFF (NTSC-CAM)
1/2 (510H.CAM VTR) 1/3 (760H.CAM)
760H:760H CCD SYSTEM
510H:510H CCD SYSTEM
PB TITLE COLOR DATA
OSC
FL701
SYSTEM CONTROL
CAM VD
PB V
FLD
TG STBY I
CRTC CS
SG CS
CAM COSM CS
DATA TO SLVE
DATA TO MAST
SCK
SYS RESET
CR PULS
K OUT 5
K IN 0
K IN 6
CN501
POWER (PS-282)
Q702 3V REG
Q708
IF 4V (IC802, 707)
IC805 ③
IC803 ②
IC803 ⑧
IC707 (84)-(95)
IC707 (51)
IC707 (64)
IC707 (66)
IC707 (80)
IC707 (68)
IC707 (94)
IC707 (69)
IC707 (50)
IC707 (67)
IC704 ⑭
IC704 (63)

3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON CS-31 BOARD: CXP80624-299Q)

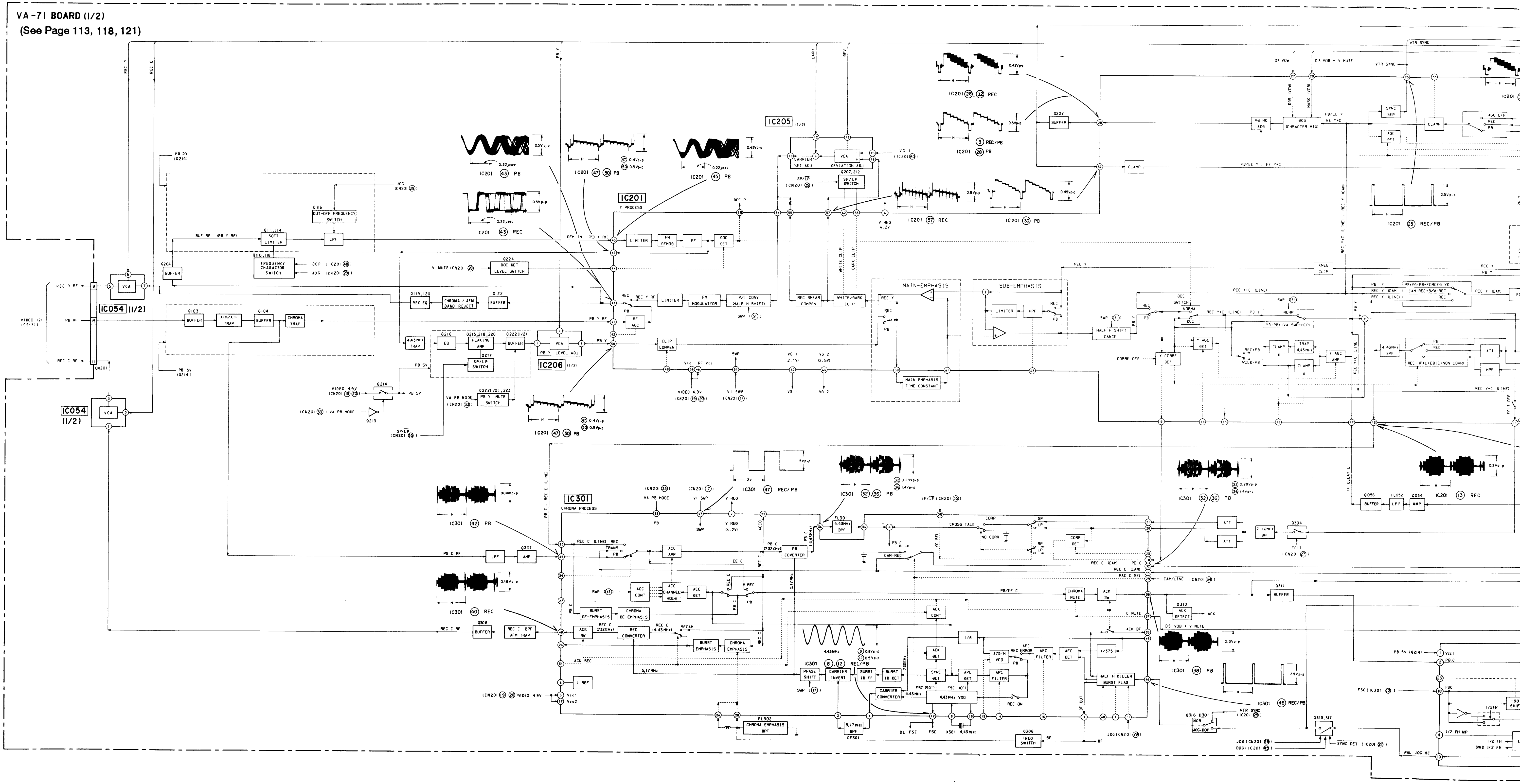
Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	EPROM SCK	O	
3	ZOOM M REV	O	Zoom motor control signal. Normally “H”. 20 msec period PWM signal when rotating to WIDE.
4	ZOOM M FWD	O	Zoom motor control signal. Normally “H”. 20 msec period PWM signal when rotating to TELE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	CORE RESET	O	Camera core (IC707 on CS-31 board) reset signal. Normally “H”. “L” when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-31 board) reset signal. Normally “H”. “L” when reset.
12	TG STBY1		Not used.
13	TG SYBY2		
14	OPD RESET	O	OPD (IC705 on CS-31 board) reset signal. “H”: camera mode. “L”: VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	
24	EPROM BUSY	I	BUSY signal from EEPROM. Normally “H”. “L” pulse when data reading/writing.
25	FOC NEAR		Not used.
26	FOC FAR		
27	PD3/C	I	Fixed to +5V.
28	TA/$\overline{\text{CA}}$	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally “L”.
31	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally “L”.
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally “H” (4.4V).
39	MP		Connected to GND.
40	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally “H”. “L” when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	CS CAM	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	VTR SCK	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used.
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 µsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 µsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally “H”.
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	CAM SCK	O	Serial data transfer clock
82	CS CAM		Not used.
83	PI/TO		
84	PI/PWM		
85	PI/PO		
86	PI O		Connected to +5V.
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	$\overline{\text{CS PDR}}$	O	Chip select signal to focus predriver (IC706 on CS-31 board)
93	$\overline{\text{CS CAM D/A}}$	O	Chip select signal to camera EVR (IC702 on CS-31 board)
94	$\overline{\text{CS ROM}}$	O	Chip select signal to EEPROM (IC712 on CS-31 board)
95	$\overline{\text{CS OPD}}$	O	Chip select signal to OPD (IC705 on CS-31 board)
96	$\overline{\text{NTSC}}$	O	NTSC: “L”, PAL: “H”
97	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC707 on CS-31 board)
98	$\overline{\text{CS TG}}$	O	Select signal to timing generator (IC801 on CS-31 board)
99	J STB		Not used.
100	PB6		

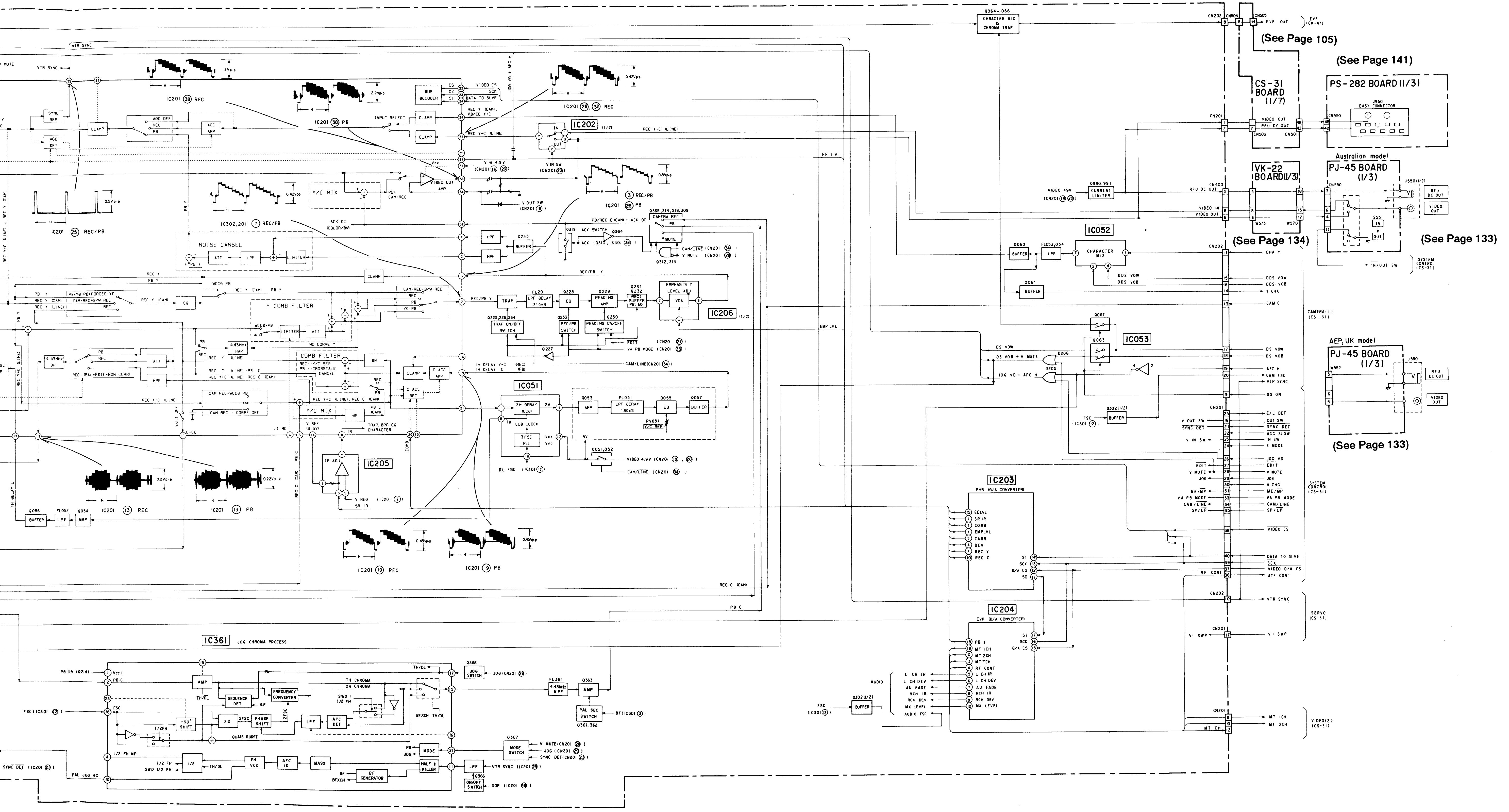
3-5. CAMERA (2) BLOCK DIAGRAM

(See Page 99)


CS-31 BOARD (1/7)
(See Page 99)
CAMERA (1)
IRIS PWM (IC709 ⑦⑤)
REF 2V (IC702 ⑫)
HALL OUT (IC709 ⑥①)
HALL OFS (IC702 ⑧)
HALL GAIN (IC702 ⑦)
ZOOM FWD (IC709 ④)
ZOOM REV (IC709 ③)
ZOOM SPD (IC702 ⑥)
AV REF (IC709 ⑤③)
ZOOM POS (IC709 ⑥②)
ZOOM POS X4 (IC702 ⑥⓪)
ZOOM PWM (IC709 ⑦⑥)
TA/CA (IC709 ㉘)
FOC IN 4 (IC706 ⑮)
FOC IN 2 (IC706 ⑬)
FOC IN 3 (IC706 ⑭)
FOC IN 1 (IC706 ⑫)
FOC END FAR (IC709 ㉚)
FOC END LED (IC709 ㊳)
LPF
IC852 (1/4)
IC851 (1/2) HALL AMP
IC851 (1/2) IRIS DRIVE
IC852 (1/4) HALL BIAS CONTROL
IC852 (1/4) HALL GAIN CONTROL
Q851
IC854 ZOOM MOTOR DRIVE
IN 1
IN 2
OUT 1
OUT 2
Vcc
V CONT
Vss
MT 5V (Q509)
Q853 DRIVE CURRENT LIMITER
IC852 (1/4) ZOOM REF
IC855 (1/2) ZOOM POS X4
IC855 (1/2) LPF
IC853 FOCUS MOTOR DRIVE
IN 1
IN 2
EN 1
EN 2
A
B
B
A
Vcc
MT 5V (Q509)
CN851
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (+)
HALL (-)
BIAS (-)
ZOOM W
ZOOM T
ZP REF
ZOOM ENC
GND
FOCUS MA
FOCUS MB
FOCUS MB
FOCUS MA
SENS Vcc
SENS
LED
LENS BLOCK
M904 IRIS MOTOR
M
H
M906 ZOOM MOTOR
M
ZOOM POSITION
M905 FOCUS MOTOR
M
FOCUS END SENSOR

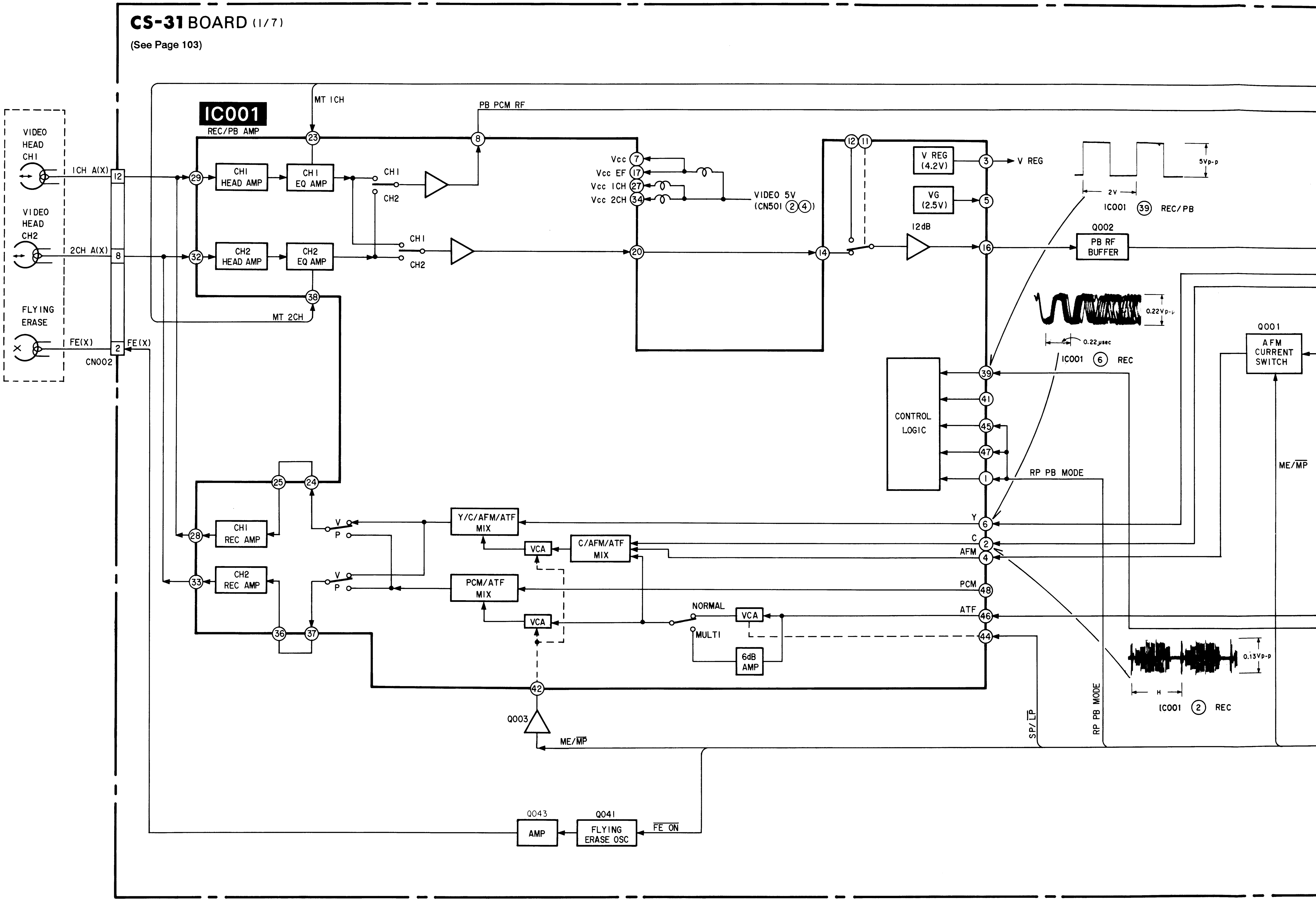
3-6. VIDEO (1) BLOCK DIAGRAM

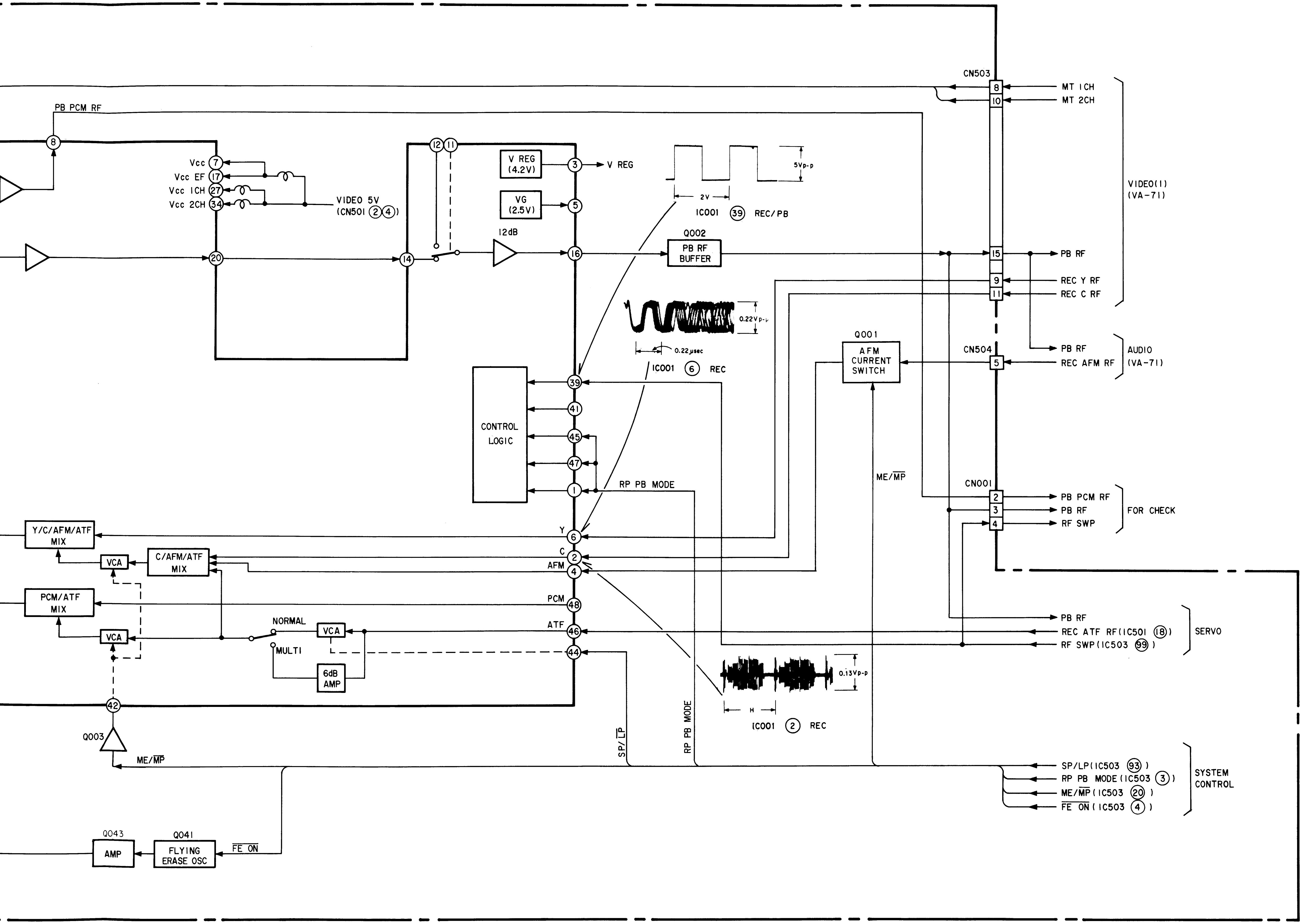

VA-71 BOARD (1/2)
(See Page 113, 118, 121)
IC054 (1/2)
VCA
BUFFER
AFM/ATF TRAP
CHROMA TRAP
SOFT LIMITER
CUT-OFF FREQUENCY SWITCH
LPF
FREQUENCY CHARACTOR SWITCH
REC Y RF
PB RF
REC C RF
VIDEO (2) (CS-31)
CN201
REC EQ
CHROMA / AFM BAND REJECT
4.43MHz TRAP
EQ
PEAKING AMP
SP/LP SWITCH
PB Y LEVEL ADJ
IC206 (1/2)
PB Y MUTE SWITCH
DOC DET LEVEL SWITCH
IC201
Y PROCESS
LIMITER
FM DEMOD
DOC DET
FM MODULATOR
V/I CONV (HALF H SHIFT)
RF AGC
CLIP COMPEN
IC205 (1/2)
CARRIER SET ADJ
VCA
DEVIATION ADJ
REC SMEAR COMPEN
WHITE/DARK CLIP
MAIN-EMPHASIS
MAIN EMPHASIS TIME CONSTANT
SUB-EMPHASIS
HPF
HALF H SHIFT CANCEL
Y CORRE DET
Y AGC DET
CLAMP
TRAP 4.43MHz
Y AGC AMP
KNEE CLIP
DDS (CHRACTER MIX)
VG HD ADD
SYNC SEP
AGC DET
Q202 BUFFER
IC201 (3) REC/PB
IC201 (26) PB
IC201 (28), (32) REC
IC201 (25) REC/PB
IC201 (57) REC
IC201 (30) PB
IC201 (43) PB
IC201 (43) REC
IC201 (45) PB
IC201 (47) (50) PB
IC201 (13) REC
IC301
CHROMA PROCESS
LPF
AMP
ACC AMP
ACC CONT
ACC CHANNEL HOLD
ACC DET
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
ACK SW
REC CONVERTER
BURST EMPHASIS
CHROMA EMPHASIS
I REF
PB COVERTER
FL301 4.43MHz BPF
CROSS TALK
CORR DET
ATT
7.16MHz BPF
CHROMA MUTE
ACK SW
ACK DET
ACK CONT
1/8
375fH VCO
AFC FILTER
AFC DET
1/375
PHASE SHIFT
CARRIER INVERT
BURST 1B FF
BURST 1B DET
SYNC DET
APC DET
APC FILTER
CARRIER CONVERTER
4.43MHz VXO
HALF H KILLER BURST FLAG
FL302 CHROMA EMPHASIS BPF
5.17MHz BPF
CF301
FREQ SWITCH
Q311 BUFFER
Q310 ACK DETECT
IC301 (42) PB
IC301 (40) REC
IC301 (8), (12) REC/PB
IC301 (47) REC/PB
IC301 (32), (36) PB
IC301 (38) PB
IC301 (46) REC/PB
Q056 BUFFER
FL052 LPF
Q054 AMP
NOR
JOG·DOP
SYNC DET (IC201 (21))
PAL JOG HC
1H DELAY L



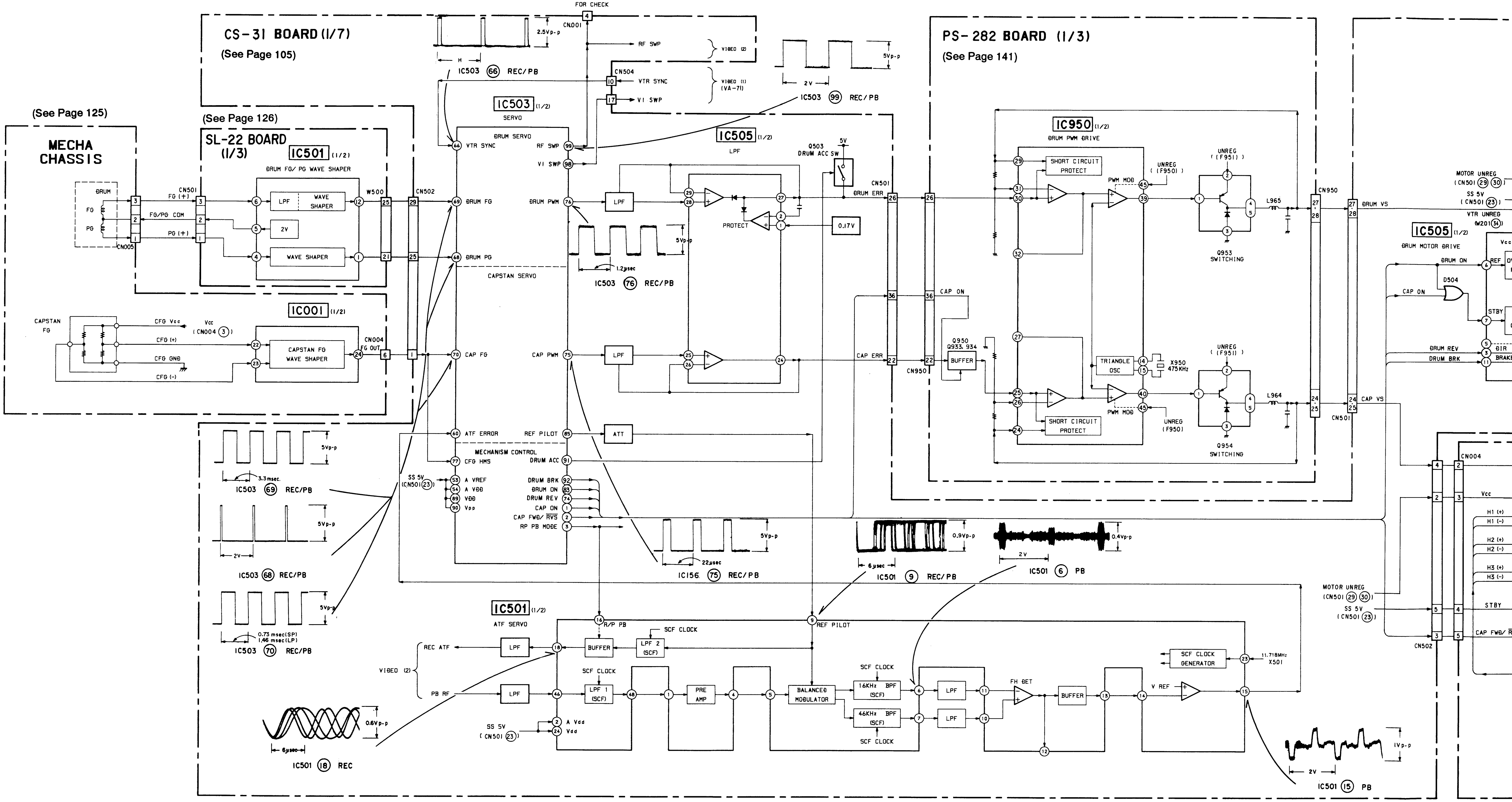
IC201 ㊳ REC
IC201 ㊳ PB
IC201 ㉘, ㉜ REC
IC202
IC201 ㉕ REC/PB
IC302,201 ⑦ REC/PB
③ REC/PB
IC201 ㉘ PB
NOISE CANSEL
Y/C MIX
Y COMB FILTER
COMB FILTER
IC206
IC051
IC205
IC201 ⑬ REC
IC201 ⑬ PB
IC201 ⑲ REC
IC201 ⑲ PB
IC361
JOG CHROMA PROCESS
IC052
IC053
IC203
EVR (D/A CONVERTER)
IC204
EVR (D/A CONVERTER)
CHARACTER MIX
(See Page 105)
(See Page 141)
CS-31 BOARD (1/7)
PS-282 BOARD (1/3)
VK-22 BOARD(1/3)
Australian model
PJ-45 BOARD (1/3)
(See Page 134)
(See Page 133)
AEP, UK model
PJ-45 BOARD (1/3)
(See Page 133)
CAMERA(1) (CS-31)
SYSTEM CONTROL (CS-31)
SERVO (CS-31)
VIDEO(2) (CS-31)
AUDIO
RFU DC OUT
VIDEO OUT
EVF OUT

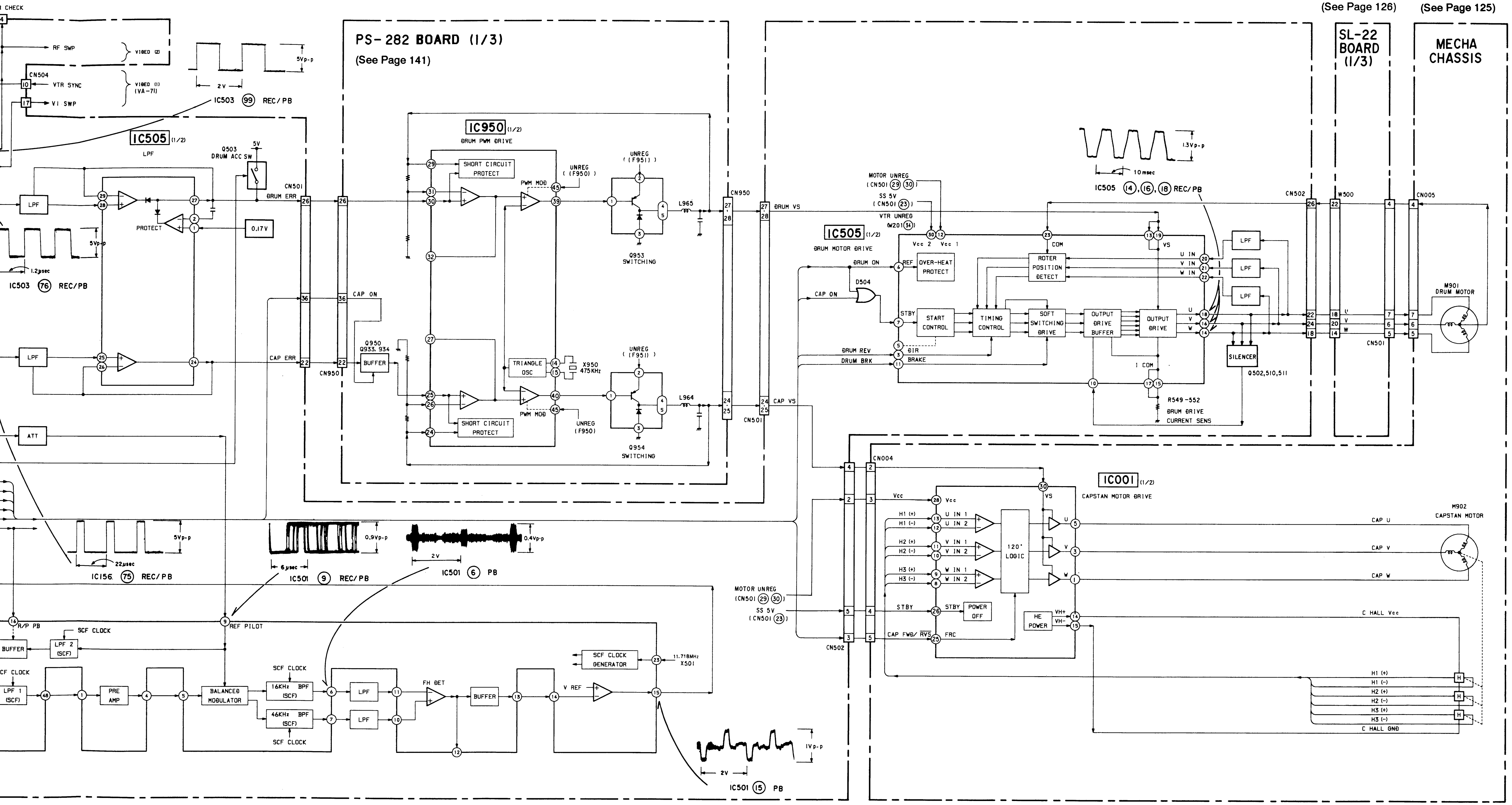
3-7. VIDEO (2) BLOCK DIAGRAM

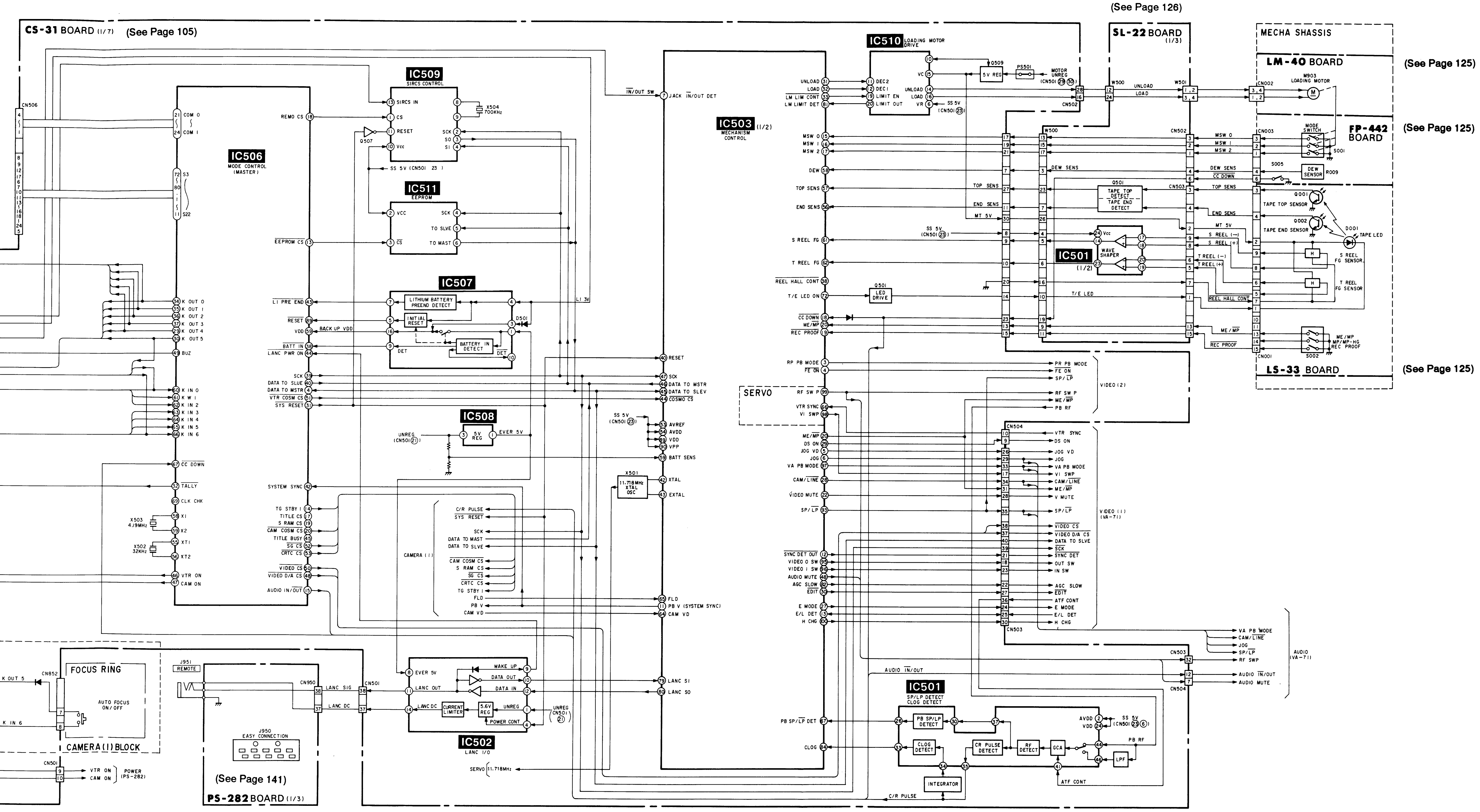

CS-31 BOARD (1/7)
(See Page 103)
IC001
REC/PB AMP
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
1CH A(X)
2CH A(X)
FE(X)
FE(X)
CN002
12
8
2
MT 1CH
MT 2CH
PB PCM RF
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
VIDEO 5V
(CN501 ②④)
12dB
V REG (4.2V)
VG (2.5V)
V REG
5Vp-p
2V
IC001 ㊴ REC/PB
Q002
PB RF BUFFER
0.22Vp-p
0.22μsec
IC001 ⑥ REC
Q001
AFM CURRENT SWITCH
CONTROL LOGIC
RP PB MODE
ME/MP
CH1 REC AMP
CH2 REC AMP
V
P
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
VCA
PCM/ATF MIX
VCA
Y
C
AFM
PCM
ATF
NORMAL
MULTI
VCA
6dB AMP
0.13Vp-p
H
IC001 ② REC
RP PB MODE
SP/LP
Q003
ME/MP
Q043
AMP
Q041
FLYING ERASE OSC
FE ON


PB PCM RF
8
Vcc 7
Vcc EF 17
Vcc 1CH 27
Vcc 2CH 34
20
VIDEO 5V
(CN501 ② ④)
12 11
14
12dB
V REG (4.2V)
VG (2.5V)
3
V REG
5
16
5Vp-p
2V
IC001 ㊴ REC/PB
Q002
PB RF BUFFER
0.22Vp-p
0.22μsec
IC001 ⑥ REC
CONTROL LOGIC
39
41
45
47
1
RP PB MODE
Y 6
C 2
AFM 4
PCM 48
ATF 46
44
42
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
VCA
PCM/ATF MIX
VCA
NORMAL
MULTI
VCA
6dB AMP
Q003
ME/MP
0.13Vp-p
H
IC001 ② REC
SP/LP
RP PB MODE
Q043
AMP
Q041
FLYING ERASE OSC
FE ON
Q001
AFM CURRENT SWITCH
ME/MP
CN503
8
10
15
9
11
MT 1CH
MT 2CH
VIDEO(1)
(VA-71)
PB RF
REC Y RF
REC C RF
CN504
5
PB RF
REC AFM RF
AUDIO
(VA-71)
CN001
2
3
4
PB PCM RF
PB RF
RF SWP
FOR CHECK
PB RF
REC ATF RF(IC501 ⑱)
RF SWP(IC503 ㊾)
SERVO
SP/LP(IC503 ㊸)
RP PB MODE(IC503 ③)
ME/MP(IC503 ⑳)
FE ON(IC503 ④)
SYSTEM CONTROL

3-8. SERVO BLOCK DIAGRAM


FOR CHECK
CS-31 BOARD (1/7)
(See Page 105)
CN001
2.5Vp-p
H
IC503 (66) REC/PB
RF SWP
VIDEO (2)
CN504
VTR SYNC
VI SWP
VIDEO (1) (VA-71)
5Vp-p
2V
IC503 (99) REC/PB
PS-282 BOARD (1/3)
(See Page 141)
(See Page 125)
MECHA CHASSIS
DRUM
FG
PG
CN005
(See Page 126)
SL-22 BOARD (1/3)
IC501 (1/2)
DRUM FG/PG WAVE SHAPER
CN501
FG (+)
FG/PG COM
PG (+)
LPF
WAVE SHAPER
2V
W500
CN502
IC503 (1/2)
SERVO
DRUM SERVO
VTR SYNC
RF SWP
VI SWP
DRUM FG
DRUM PG
DRUM PWM
CAPSTAN SERVO
CAP FG
CAP PWM
ATF ERROR
REF PILOT
MECHANISM CONTROL
CFG HMS
DRUM ACC
A VREF
A VDD
VDD
Vpp
DRUM BRK
DRUM ON
DRUM REV
CAP ON
CAP FWD/RVS
RP PB MODE
SS 5V (CN501 (23))
IC505 (1/2)
LPF
PROTECT
0.17V
Q503 DRUM ACC SW
5V
1.2μsec
IC503 (76) REC/PB
ATT
CN501
DRUM ERR
CAP ON
CAP ERR
CN950
Q950 Q933, 934 BUFFER
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
UNREG (F950)
PWM MOD
TRIANGLE OSC
X950 475KHz
UNREG (F951)
Q953 SWITCHING
Q954 SWITCHING
L965
L964
CN950
CN501
DRUM VS
CAP VS
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
VTR UNREG (W201 (34))
IC505 (1/2)
DRUM MOTOR DRIVE
DRUM ON
D504
CAP ON
STBY
DRUM REV
DRUM BRK
REF
DIR
BRAKE
CN004
Vcc
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
STBY
CAP FWD/R
CN502
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
CAPSTAN FG
CFG Vcc
Vcc (CN004 (3))
CFG (+)
CFG GND
CFG (-)
IC001 (1/2)
CAPSTAN FG WAVE SHAPER
CN004 FG OUT
3.3msec.
IC503 (69) REC/PB
2V
IC503 (68) REC/PB
0.73 msec(SP) 1.46 msec(LP)
IC503 (70) REC/PB
22μsec
IC156 (75) REC/PB
0.9Vp-p
6μsec
IC501 (9) REC/PB
0.4Vp-p
IC501 (6) PB
IC501 (1/2)
ATF SERVO
R/P PB
SCF CLOCK
REF PILOT
REC ATF
VIDEO (2)
PB RF
BUFFER
LPF 2 (SCF)
LPF 1 (SCF)
PRE AMP
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
FH DET
V REF
SCF CLOCK GENERATOR
11.718MHz X501
A Vdd
Vdd
0.6Vp-p
6μsec
IC501 (18) REC
1Vp-p
IC501 (15) PB


CHECK
RF SWP
VIDEO (2)
CN504
VTR SYNC
VIDEO (1) (VA-71)
VI SWP
5Vp-p
2V
IC503 (99) REC/PB
IC505 (1/2)
LPF
Q503 DRUM ACC SW
5V
CN501
DRUM ERR
PROTECT
0.17V
5Vp-p
1.2µsec
IC503 (76) REC/PB
CAP ERR
ATT
5Vp-p
22µsec
IC156 (75) REC/PB
0.9Vp-p
6µsec
IC501 (9) REC/PB
0.4Vp-p
2V
IC501 (6) PB
PS-282 BOARD (1/3)
(See Page 141)
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
UNREG (F950)
PWM MOD
UNREG (F951)
L965
Q953 SWITCHING
CAP ON
Q950 Q933, 934
BUFFER
CN950
TRIANGLE OSC
X950 475KHz
L964
Q954 SWITCHING
CN950
DRUM VS
CAP VS
CN501
(See Page 126)
(See Page 125)
SL-22 BOARD (1/3)
MECHA CHASSIS
1.3Vp-p
10msec
IC505 (14), (16), (18) REC/PB
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
VTR UNREG (W201 (34))
IC505 (1/2)
DRUM MOTOR DRIVE
Vcc 2
Vcc 1
COM
VS
DRUM ON
OVER-HEAT PROTECT
ROTER POSITION DETECT
U IN
V IN
W IN
LPF
D504
CAP ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
DRUM REV
DIR
DRUM BRK
BRAKE
I COM
SILENCER
Q502, 510, 511
R549-552
DRUM DRIVE CURRENT SENS
CN502
W500
CN005
CN501
M901 DRUM MOTOR
U
V
W
CN004
IC001 (1/2)
CAPSTAN MOTOR DRIVE
Vcc
H1 (+)
H1 (−)
H2 (+)
H2 (−)
H3 (+)
H3 (−)
U IN 1
U IN 2
V IN 1
V IN 2
W IN 1
W IN 2
120° LOGIC
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
STBY
POWER OFF
HE POWER
VH+
VH−
CAP FWD/RVS
FRC
CN502
M902 CAPSTAN MOTOR
CAP U
CAP V
CAP W
C HALL Vcc
H1 (+)
H1 (−)
H2 (+)
H2 (−)
H3 (+)
H3 (−)
C HALL GND
R/P PB
SCF CLOCK
BUFFER
LPF 2 (SCF)
REF PILOT
LPF 1 (SCF)
PRE AMP
BALANCED MODULATOR
SCF CLOCK
16KHz BPF (SCF)
46KHz BPF (SCF)
SCF CLOCK
LPF
LPF
FH DET
BUFFER
V REF
SCF CLOCK GENERATOR
11.718MHz X501
1Vp-p
2V
IC501 (15) PB


CS-31 BOARD (1/7) (See Page 105)
(See Page 126)
SL-22 BOARD (1/3)
MECHA SHASSIS
LM-40 BOARD (See Page 125)
FP-442 BOARD (See Page 125)
LS-33 BOARD (See Page 125)
IC506 MODE CONTROL (MASTER)
IC509 SIRCS CONTROL
IC511 EEPROM
IC507
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
IC508 5V REG
IC510 LOADING MOTOR DRIVE
IC503 (1/2) MECHANISM CONTROL
IC501 (1/2) WAVE SHAPER
IC501 SP/LP DETECT CLOG DETECT
IC502 LANC I/O
X501 11.718MHz XTAL OSC
X504 700KHz
X503 4.19MHz
X502 32KHz
Q507
Q509
Q501 LED DRIVE
Q501 TAPE TOP DETECT TAPE END DETECT
PS501
M903 LOADING MOTOR
MODE SWITCH S001
S005 DEW SENSOR R009
Q001 TAPE TOP SENSOR
Q002 TAPE END SENSOR
D001 TAPE LED
S REEL FG SENSOR
T REEL FG SENSOR
ME/MP MP/MP-HG REC PROOF S002
SERVO
VIDEO (2)
VIDEO (1) (VA-71)
AUDIO (VA-71)
CAMERA (1)
FOCUS RING
AUTO FOCUS ON/OFF
CAMERA (1) BLOCK
J951 REMOTE
J950 EASY CONNECTION
(See Page 141)
PS-282 BOARD (1/3)
POWER (PS-282)
VTR ON
CAM ON
CN506
CN852
CN950
CN501
CN502
CN503
CN504
W500
W501
CN002
CN003
CN001
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
BUZ
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
CC DOWN
TALLY
CLK CHK
REMO CS
EEPROM CS
LI PRE END
RESET
VDD
BATT IN
LANC PWR ON
SCK
DATA TO SLVE
DATA TO MSTR
VTR COSM CS
SYS RESET
SYSTEM SYNC
TG STBY I
TITLE CS
S RAM CS
CAM COSM CS
TITLE BUSY
SG CS
CRTC CS
VIDEO CS
VIDEO D/A CS
AUDIO IN/OUT
BACK UP VDD
EVER 5V
UNREG (CN501 ㉑)
SS 5V (CN501 ㉓)
LI 3V
C/R PULSE
SYS RESET
FLD
PB V
CAM VD
IN/OUT SW
JACK IN/OUT DET
AVREF
AVDD
VPP
BATT SENS
XTAL
EXTAL
PB V (SYSTEM SYNC)
LANC SI
LANC SO
WAKE UP
DATA OUT
DATA IN
LANC SIG
LANC DC
LANC OUT
CURRENT LIMITER
5.6V REG
POWER CONT
SERVO 11.718MHz
UNLOAD
LOAD
LM LIM CONT
LM LIMIT DET
DEC2
DEC1
LIMIT EN
LIMIT OUT
MOTOR UNREG (CN501 ㉙㉚)
MSW 0
MSW 1
MSW 2
DEW
DEW SENS
TOP SENS
END SENS
MT 5V
S REEL FG
T REEL FG
REEL HALL CONT
T/E LED ON
T/E LED
CC DOWN
ME/MP
REC PROOF
RP PB MODE
FE ON
SP/LP
RF SW P
VTR SYNC
VI SWP
ME/MP
DS ON
JOG VD
JOG
VA PB MODE
CAM/LINE
VIDEO MUTE
V MUTE
VIDEO CS
VIDEO D/A CS
SYNC DET OUT
VIDEO 0 SW
VIDEO 1 SW
AUDIO MUTE
AGC SLOW
EDIT
E MODE
E/L DET
H CHG
OUT SW
IN SW
ATF CONT
PR PB MODE
RF SWP
PB RF
AUDIO IN/OUT
PB SP/LP DET
CLOG
PB SP/LP DETECT
CLOG DETECT
CR PULSE DETECT
RF DETECT
GCA
LPF
INTEGRATOR
ATF CONT

3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC503 ON CS-31 BOARD: CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.
2	PB4/PP012	CAP FWD/$\overline{\text{RVS}}$	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-31 board) and ATF servo IC (IC501 on CS-31 board). "H": PB.
4	PB2/PP010	$\overline{\text{FE ON}}$	O	RP	Flying erase oscillation ON/OFF control signal. "L": oscillation.
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.
7	PC7/RT07	JACK $\overline{\text{IN}}$/OUT	I	VA	Jack in/out switch input. "L" when input.
8	PC6/RT06	1.7M DET	I	VA	Not used.
9	PC5/RT05	JACK $\overline{\text{MONO}}$/STE DET	I	VA	
10	PC4/RT04	INT VD	I		
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
12	PC2/RT018	$\overline{\text{SYNC DET OUT}}$	O	VA	Sync detect output. "L" when Sync is detected.
13	PC1/RT017	E/$\overline{\text{L}}$ DET	I	VA	Not used.
14	PC0/RT016	MIC $\overline{\text{MONO}}$/ST DET	I	AU	
15	PJ7	M SW 0	I	MD	Mode switch input.
16	PJ6	M SW 1	I	MD	
17	PJ5	M SW 2	I	MD	

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	H	L	L	H	L	H	H	L	L
M SW 1	H	H	L	L	L	L	H	H	L
M SW 2	H	H	H	H	H	L	L	L	L

Pin No.	Port Name	Signal	I/O	Connection	Function
18	PJ4	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment down switch input. "L": down.
19	PJ3	$\overline{\text{REC PROOF}}$	I	MD	Erasure protection switch input. "L" when REC prohibit.
20	PJ2	ME/$\overline{\text{MP}}$	I	MD	ME/MP switch input. "L": MP, "H": ME.
21	PJ1	HG/$\overline{\text{NOR}}$	I	MD	Connected to GND.
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. "H": mute.
23	PD7	LINE MIX	I	VA	Not used.
24	PD6	MAT SEL 1	I	VA	
25	PD5	MAT SEL 2	I	VA	
26	PD4	MAT ON/$\overline{\text{OFF}}$	O	VA	
27	PD3	E MODE	O	VA	
28	PD2	CAM/$\overline{\text{LINE}}$	O	VA	Camera input/line input select signal. "H" when camera input.
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. "H": ON.
30	PD0	$\overline{\text{EDIT}}$	O	VA	Video circuit EDIT/NORMAL switch signal. "L": EDIT.
31	PH7	UNLOAD	O	SS	Loading motor control signal. "H" or "H" pulse when unloading.
32	PH6	LOAD	O	SS	Loading motor control signal. "H" or "H" pulse when loading.
33	PH5	$\overline{\text{LM LIM COM}}$	O	SS	Loading motor limiter control signal. Temporary "H" when loading.
34	PH4	COMP REC	O	VA	Not used.
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally "L".
36	PH2		O		N.C.
37	PH1		O		
38	PH0	$\overline{\text{REEL HALL CONT}}$	O	SS	Reel FG sensor (HALL element) power supply control signal. Not used.
39	MP	MP			Connected to GND.
40	RST	$\overline{\text{RESET}}$	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.
41	VSS	VSS			GND
42	XTAL	XTAL	I	SS	11.718 MHz clock oscillation circuit.
43	EXTAL	EXTAL	O	SS	
44	CSO	$\overline{\text{COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (CS-31 board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.

Pin No.	Port Name	Signal	I/O	Connection	Function
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.4 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1389 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD

Pin No.
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XP80624)

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-31 board) and

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H	H	L
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31 board

Pin No.	Port Name	Signal	I/O	Connection	Function
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.4 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1389 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD

Pin No.	Port Name	Signal	I/O	Connection	Function
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally "L". "H" pulse when SLOW mode.
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally "L".
93	PA5/PP05	SP/$\overline{\text{LP}}$	O	VA	SP/LP select signal. "L": LP.
94	PA4/PP04		O		N.C.
95	PA3/PP03	VIDEO O SW	O	VA	VIDEO OUT inhibit signal. "H": inhibit.
96	PA2/PP02	VIDEO I SW	O	VA	VIDEO IN/OUT select signal. "L": VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 25 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 25 Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC506 ON CS-31 BOARD: µPD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC511 on CS-31 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-31 board). Normally "L".
15	S26/BP2	AUDIO IN/$\overline{\text{OUT}}$	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Not used.
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-31 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Not used.
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on CS-31 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor. Not used.
26	VLC0	VCC 0	I		Power source 0 input Power source for LCD dirve. Not used.
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	$\overline{\text{BATT IN}}$	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/$\overline{\text{SCK}}$	SCK	O	all	Serial clock output terminal, Serial clock (2 µS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 µS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 µS) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-31 board).
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Not used.
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "VTR" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-71 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-71 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-31 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-31 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-31 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			N.C.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	Cassette compartment lock switch input. "L": Lock.
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	System reset input. "L": Reset, Normally: "H".
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		N.C.
69	S0	CLK CHK	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
70	S1	S1	O		
71	S2	S2	O		
72	S3	S3	O		
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (CS-31 BOARD)

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB-PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC *17	REC *17 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	IC503 (93)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2	*2	*16	H/L	H/L	*16	*2	*2	H	H
VA PB MODE	O	IC503 (97)	L	L	L	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE *13	O	IC503 ㊽	L	L	L	H	H	L	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
VIDEO MUTE	O	IC503 ㉒	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
CAM/$\overline{\text{LINE}}$	O	IC503 ㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
JOG VD	O	IC503 ⑤	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	IC503 ④	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
RF SWP	O	IC503 (99)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC503 ⑥	L	L	L	H	H	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
$\overline{\text{VIDEO CS}}$	O	IC506 ㊿	V period “L” pulse																					
$\overline{\text{VIDEO D/A CS}}$	O	IC506 ㊽	V period ’H” pulse																					
DATA TO MSTR	I	IC506 ㊶	V period “L” pulse																					
DATA TO SLVE	O	IC506 ㊵	V period pulse train																					
SCK	I	IC506 ㊴	V period “H” pulse																					
PB SP/$\overline{\text{LP}}$ DET	I	IC503 (67)	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
CLOG	I	IC503 (84)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
VTR SYNC	I	IC503 (66)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs discrimination result of the mode just before. “H”: SP mode, “L”: LP mode.
*2. Outputs discrimination result of the playback tape. “H” : SP mode, “L”: LP mode.
*3. Edit search button pressed when playback pause mode.
*5. False VD signal
*7. 25 Hz duty 50% pulse (synchronized with drum rotation)
*10. “H”: SP recording area on tape. “L”: LP recording area.
*11. “H”: no recording area or drop out area on tape. Head clog detection input.
*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)
*13. “H” during camera mode load/unload.
*14. “L” when external input (video) present. “H” when other cases.
*15. “H” when tape no signal. “L” when other cases.
*16. By REC MODE switch. “H”: SP mode, “L”: LP mode.
*17. Australian model only.

3-12-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB-PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT*13		REC*14	REC*14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
T.REEL FG	I	IC503(62)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	IC503(61)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	IC503(60)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC503(68)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC503(69)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC503(70), (77)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC503①	L	H	H	H	H	H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
REF PILOT	O	IC503(85)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC503③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
DRUM FWD/$\overline{\text{RVS}}$ *10	O	IC503㉟	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ $\overline{\text{RVS}}$	O	IC503②	L	H	L	H	L	H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
DRUM PWM	O	IC503(76)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC503(75)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC503㉝	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC503(83)	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC	O	IC503(91)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
DRUM BRK	O	IC503(92)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*1. Inputting waveform which is similar to sine wave according to reel rotation.

*2. ATF error voltage input

*3. One PG pulse input per one drum rotation, approx. 25 Hz.

*4. 12 FG pulses input per one drum rotation, approx. 300 Hz.

*5. 520 FG pulses input per one capstan rotation. Approx. 1389 Hz when REC/PB (SP).
697 Hz when PB (LP).

*6. Four frequencies output synchronized with drum rotation. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz

*7. f2 (117.19 kHz) output

*8. "H" pulse when tape run.

*9. 21.5 μsec period PWM signal

*10. Normally "H". Temporary "L" when load (drum reverse rotation).

*11. Temporary "H" when cassette loading (finger catch protection).

*12. "H": approx. 1.3 Vdc

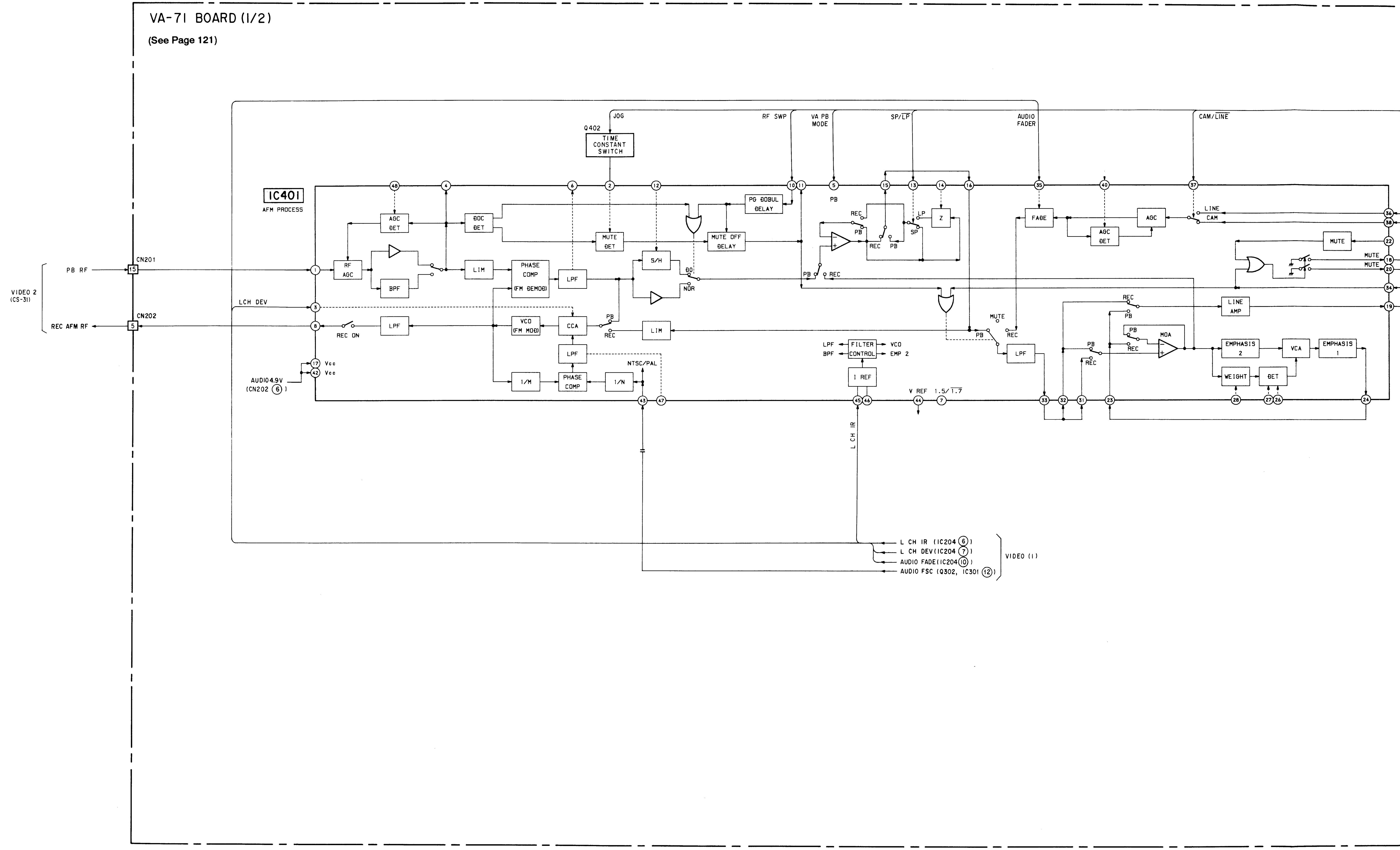
*13. Edit search button pressed when playback pause mode.

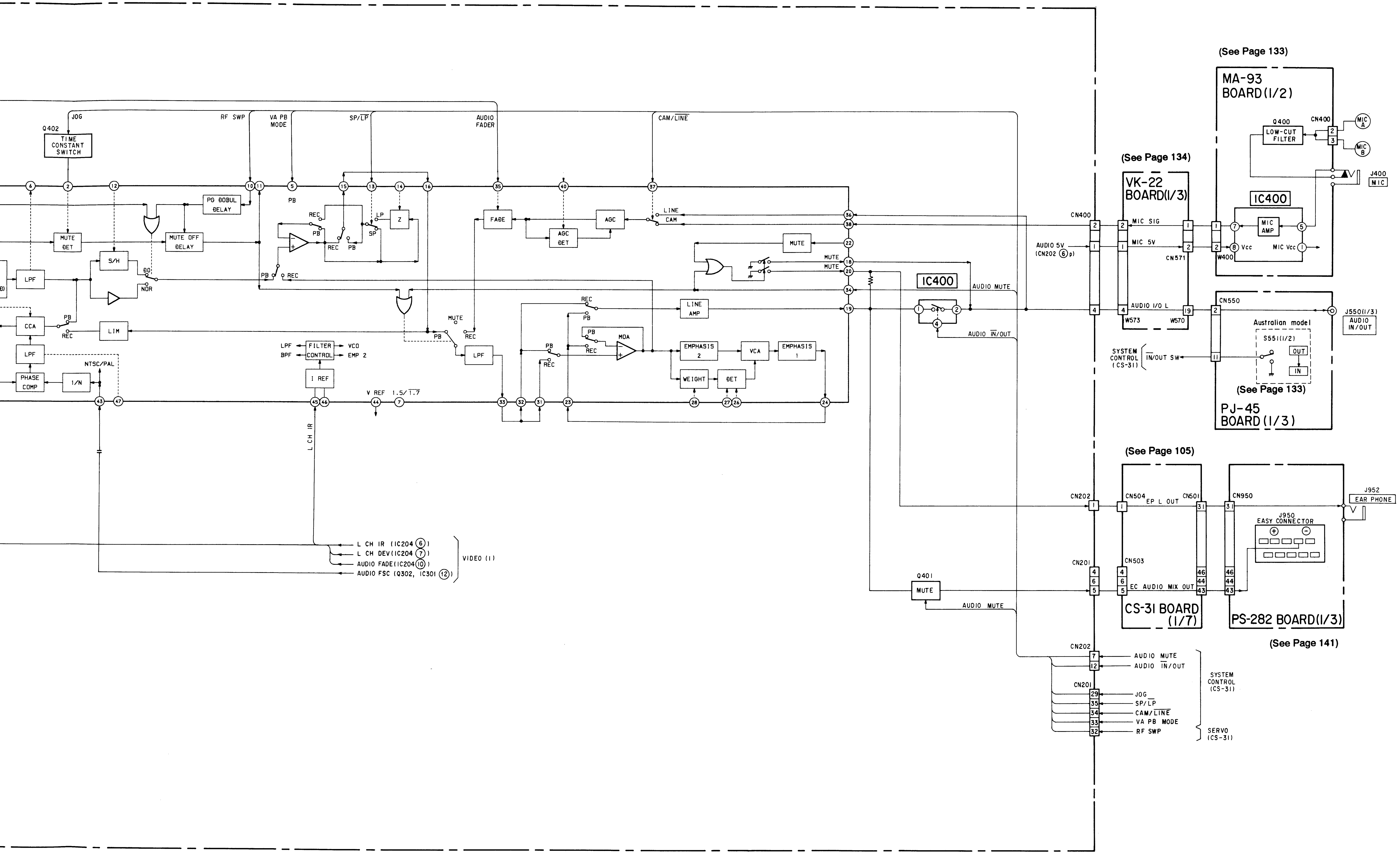
*14. Australian model only.

VTR MODE									CAMERA MODE					
ARCH EVIEW	PB-PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC *14	REC *14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
					FWD	REV					FWD	RVS	FWD	RVS
*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*7. f2 (117.19 kHz) output
*8. "H" pulse when tape run.
*9. 21.5 μsec period PWM signal
*10. Normally "H". Temporary "L" when load (drum reverse rotation).
*11. Temporary "H" when cassette loading (finger catch protection).
*12. "H": approx. 1.3 Vdc
*13. Edit search button pressed when playback pause mode.
*14. Australian model only.

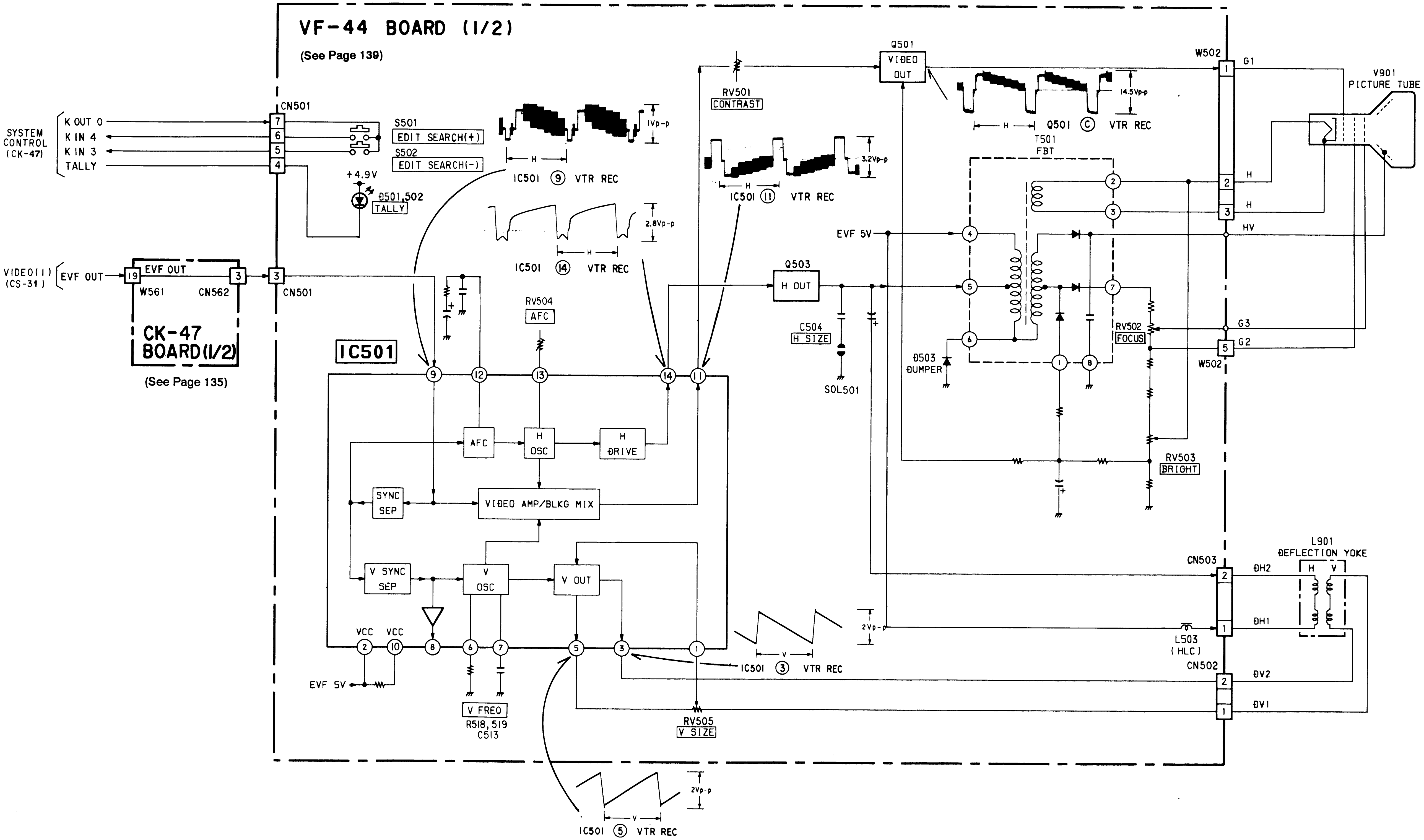
3-13. AUDIO BLOCK DIAGRAM


VA-71 BOARD (1/2)
(See Page 121)
IC401
AFM PROCESS
Q402
TIME CONSTANT SWITCH
JOG
RF SWP
VA PB MODE
SP/LP
AUDIO FADER
CAM/LINE
AGC DET
DOC DET
MUTE DET
MUTE OFF DELAY
PG DOBUL DELAY
RF AGC
BPF
LIM
PHASE COMP (FM DEMOD)
LPF
S/H
DO
NOR
VCO (FM MOD)
CCA
PHASE COMP
1/M
1/N
NTSC/PAL
REC ON
PB
REC
LP
SP
Z
FADE
AGC
LINE
CAM
MUTE
LINE AMP
MOA
EMPHASIS 2
VCA
EMPHASIS 1
WEIGHT
DET
FILTER CONTROL
LPF
BPF
VCO
EMP 2
I REF
V REF 1.5/1.7
Vcc
AUDIO4.9V (CN202 ⑥)
CN201
CN202
PB RF
REC AFM RF
VIDEO 2 (CS-31)
LCH DEV
L CH IR
L CH IR (IC204 ⑥)
L CH DEV (IC204 ⑦)
AUDIO FADE (IC204 ⑩)
AUDIO FSC (Q302, IC301 ⑫)
VIDEO (1)



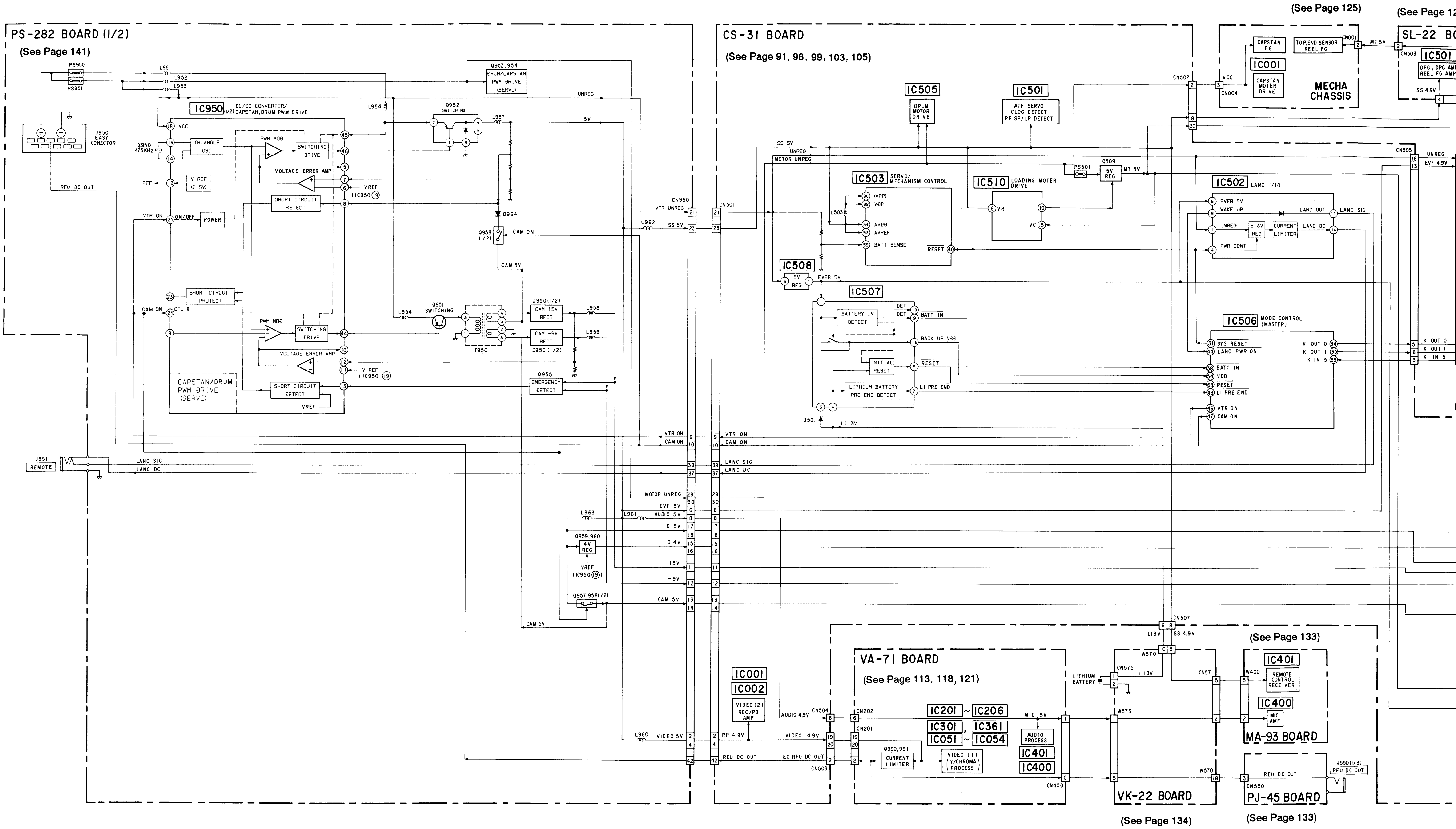
(See Page 133)
MA-93 BOARD(1/2)
Q400
LOW-CUT FILTER
CN400
MIC A
MIC B
J400 MIC
IC400
MIC AMP
Vcc
MIC Vcc
W400
(See Page 134)
VK-22 BOARD(1/3)
MIC SIG
MIC 5V
CN571
AUDIO I/O L
W573
W570
CN400
AUDIO 5V (CN202 ⑥p)
CN550
Australian model
S551(1/2)
OUT
IN
J550(1/3) AUDIO IN/OUT
SYSTEM CONTROL (CS-31)
IN/OUT SW
(See Page 133)
PJ-45 BOARD(1/3)
Q402
TIME CONSTANT SWITCH
JOG
RF SWP
VA PB MODE
SP/LP
AUDIO FADER
CAM/LINE
PG DOBUL DELAY
MUTE DET
MUTE OFF DELAY
S/H
DO
NOR
LPF
CCA
LIM
PHASE COMP
1/N
NTSC/PAL
REC
PB
LP
SP
Z
FADE
AGC DET
AGC
LINE
CAM
MUTE
LINE AMP
MOA
EMPHASIS 2
VCA
EMPHASIS 1
WEIGHT
DET
FILTER CONTROL
VCO
EMP 2
BPF
I REF
V REF 1.5/1.7
IC400
AUDIO MUTE
AUDIO IN/OUT
L CH IR
L CH IR (IC204 ⑥)
L CH DEV (IC204 ⑦)
AUDIO FADE (IC204 ⑩)
AUDIO FSC (Q302, IC301 ⑫)
VIDEO (1)
Q401
MUTE
(See Page 105)
CN202
CN504
EP L OUT
CN501
CN950
J952 EAR PHONE
J950 EASY CONNECTOR
CN201
CN503
EC AUDIO MIX OUT
CS-31 BOARD (1/7)
PS-282 BOARD(1/3)
(See Page 141)
AUDIO MUTE
AUDIO IN/OUT
SYSTEM CONTROL (CS-31)
JOG
SP/LP
CAM/LINE
VA PB MODE
RF SWP
SERVO (CS-31)

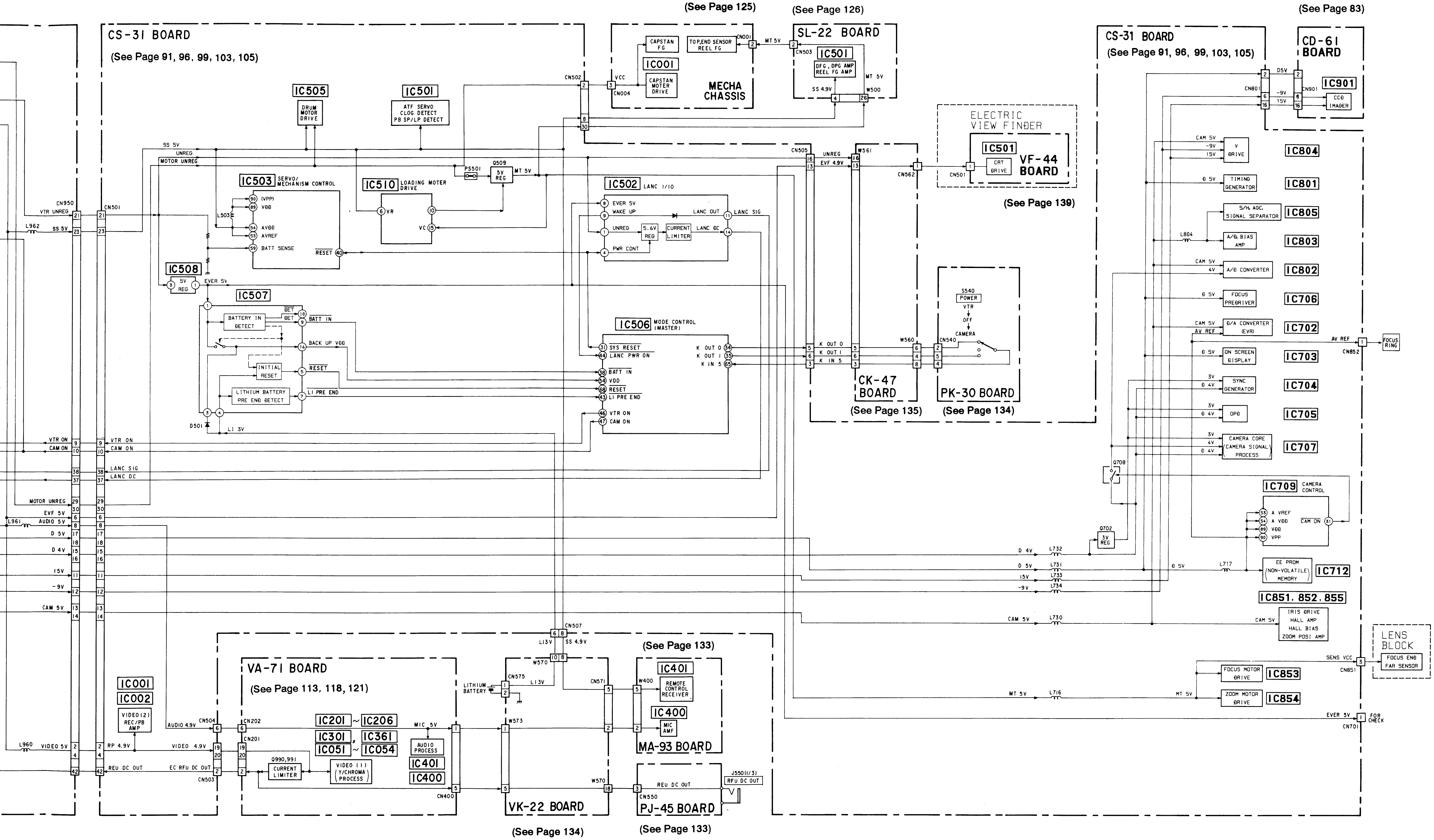
3-14. EVF BLOCK DIAGRAM



VF-44 BOARD (1/2)
(See Page 139)
SYSTEM CONTROL (CK-47)
K OUT 0
K IN 4
K IN 3
TALLY
CN501
7
6
5
4
S501
EDIT SEARCH(+)
S502
EDIT SEARCH(-)
+4.9V
D501,502
TALLY
VIDEO(1) (CS-31)
EVF OUT
EVF OUT
19
3
W561
CN562
CK-47 BOARD(1/2)
(See Page 135)
3
CN501
IC501
1Vp-p
H
IC501 ⑨ VTR REC
2.8Vp-p
IC501 ⑭ VTR REC
RV504
AFC
RV501
CONTRAST
3.2Vp-p
IC501 ⑪ VTR REC
Q501
VIDEO OUT
14.5Vp-p
Q501 © VTR REC
T501
FBT
W502
G1
V901
PICTURE TUBE
H
H
HV
EVF 5V
Q503
H OUT
C504
H SIZE
SOL501
D503
DUMPER
RV502
FOCUS
G3
G2
W502
RV503
BRIGHT
⑨
⑫
⑬
⑭
⑪
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
VCC
②
⑩
⑧
⑥
⑦
⑤
③
①
EVF 5V
V FREQ
R518, 519
C513
RV505
V SIZE
2Vp-p
V
IC501 ③ VTR REC
L503
(HLC)
CN503
CN502
L901
DEFLECTION YOKE
H
V
DH2
DH1
DV2
DV1
2Vp-p
IC501 ⑤ VTR REC

3-15. POWER BLOCK DIAGRAM

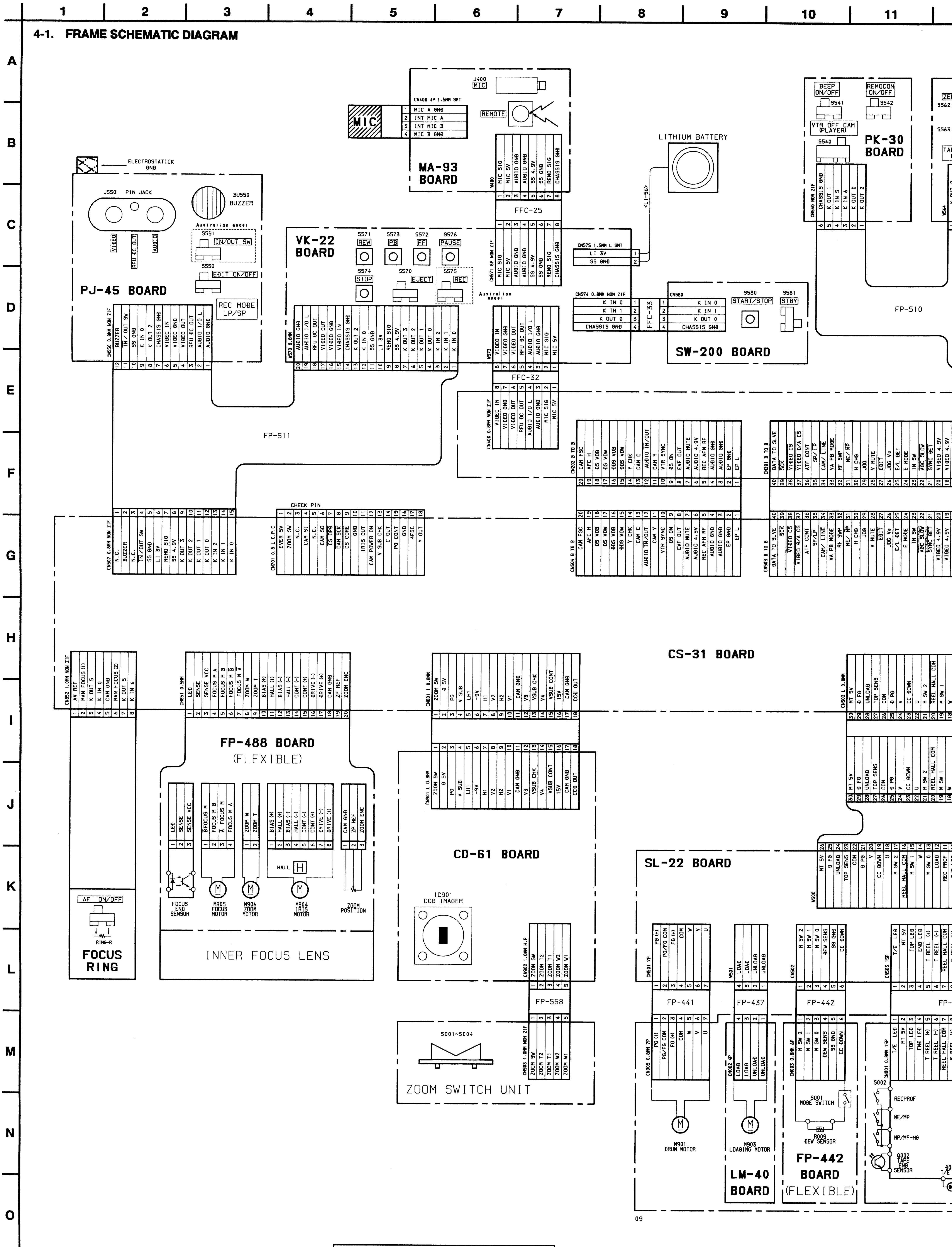

PS-282 BOARD (1/2)
(See Page 141)
PS950
PS951
L951
L952
L953
L954
J950 EASY CONECTOR
RFU DC OUT
IC950 (1/2) DC/DC CONVERTER/CAPSTAN,DRUM PWM DRIVE
VCC
X950 475KHz
TRIANGLE OSC
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
V REF (2.5V)
REF
VREF (IC950 ⑲)
SHORT CIRCUIT DETECT
VTR ON
ON/OFF
POWER
Q953,954 DRUM/CAPSTAN PWM DRIVE (SERVO)
UNREG
Q952 SWITCHING
L957
5V
D964
Q958 (1/2)
CAM ON
CAM 5V
SHORT CIRCUIT PROTECT
CTL B
Q951 SWITCHING
T950
D950 (1/2) CAM 15V RECT
CAM -9V RECT
L958
L959
CAPSTAN/DRUM PWM DRIVE (SERVO)
Q955 EMERGENCY DETECT
J951 REMOTE
LANC SIG
LANC DC
CN950
VTR UNREG
L962
SS 5V
MOTOR UNREG
EVF 5V
L963
L961
AUDIO 5V
D 5V
Q959,960 4V REG
D 4V
15V
-9V
VREF (IC950 ⑲)
Q957,958 (1/2)
CAM 5V
L960
VIDEO 5V
CS-31 BOARD
(See Page 91, 96, 99, 103, 105)
CN501
SS 5V
UNREG
MOTOR UNREG
IC505 DRUM MOTOR DRIVE
IC501 ATF SERVO CLOG DETECT PB SP/LP DETECT
IC503 SERVO/MECHANISM CONTROL
(VPP)
VDD
AVDD
AVREF
BATT SENSE
RESET
L503
IC510 LOADING MOTER DRIVE
VR
VC
PS501
Q509 5V REG
MT 5V
IC508 5V REG
EVER 5V
IC507
BATTERY IN DETECT
DET
BATT IN
BACK UP VDD
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
LI PRE END
D501
LI 3V
IC502 LANC I/O
EVER 5V
WAKE UP
LANC OUT
LANC SIG
UNREG
5.6V REG
CURRENT LIMITER
LANC DC
PWR CONT
IC506 MODE CONTROL (MASTER)
SYS RESET
LANC PWR ON
BATT IN
VDD
RESET
LI PRE END
VTR ON
CAM ON
K OUT 0
K OUT 1
K IN 5
CN502
CN507
LI 3V
SS 4.9V
(See Page 125)
CAPSTAN FG
TOP,END SENSOR REEL FG
IC001
CAPSTAN MOTER DRIVE
VCC
CN004
CN001
MECHA CHASSIS
MT 5V
(See Page 12
SL-22 B
CN503
IC501
DFG, DPG AMP REEL FG AMP
SS 4.9V
CN505
UNREG
EVF 4.9V
K OUT 0
K OUT 1
K IN 5
IC001
IC002
VIDEO (2) REC/PB AMP
AUDIO 4.9V
CN504
RP 4.9V
VIDEO 4.9V
REU DC OUT
EC RFU DC OUT
CN503
VA-71 BOARD
(See Page 113, 118, 121)
CN202
CN201
IC201 ~ IC206
IC301, IC361
IC051 ~ IC054
MIC 5V
AUDIO PROCESS
IC401
IC400
Q990,991 CURRENT LIMITER
VIDEO (1) Y/CHROMA PROCESS
CN400
LITHIUM BATTERY
CN575
W570
W573
VK-22 BOARD
(See Page 134)
CN571
(See Page 133)
IC401 REMOTE CONTROL RECEIVER
W400
IC400 MIC AMF
MA-93 BOARD
REU DC OUT
CN550
J550 (1/3) RFU DC OUT
PJ-45 BOARD
(See Page 133)

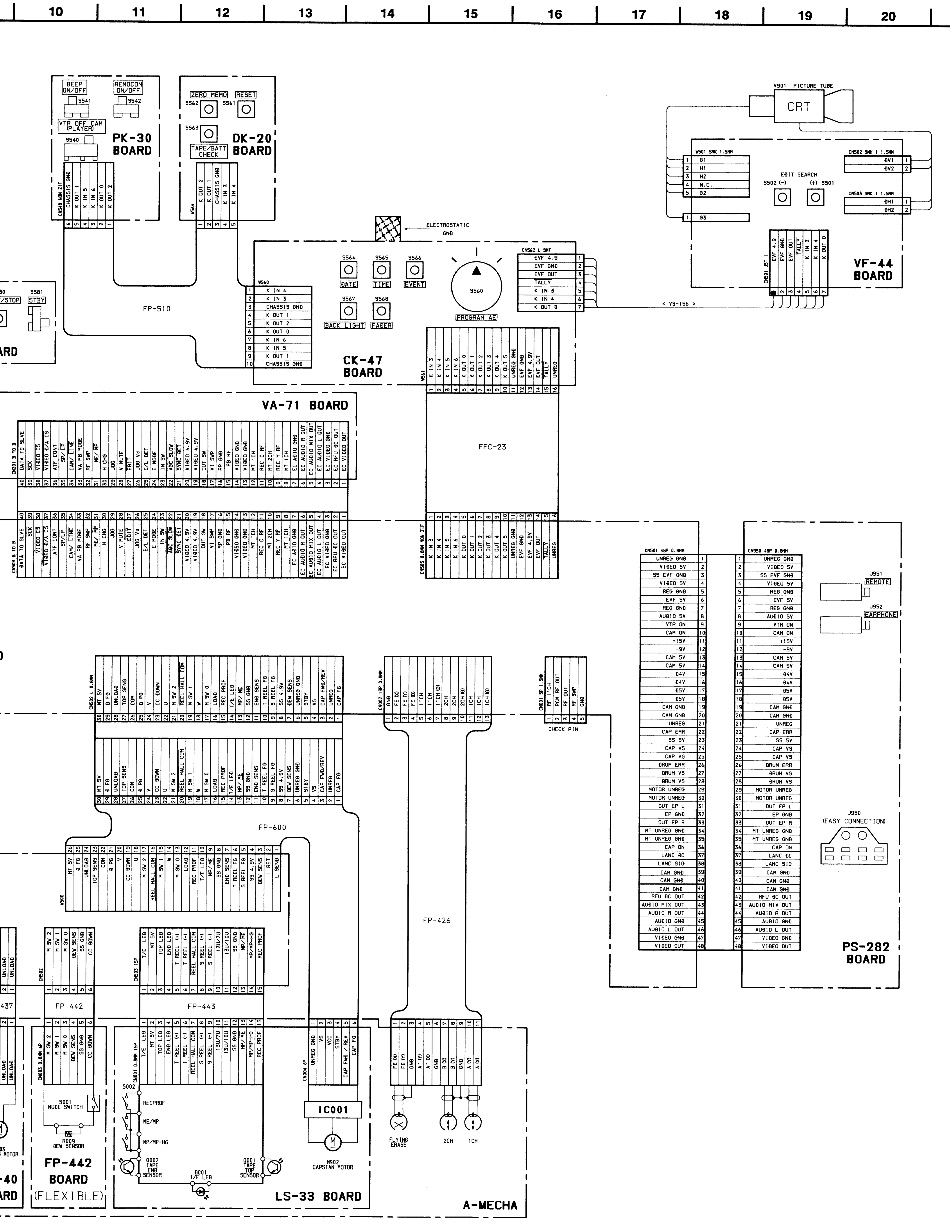


CS-31 BOARD
(See Page 91, 96, 99, 103, 105)
(See Page 125)
MECHA CHASSIS
CAPSTAN FG
TOP,END SENSOR REEL FG
IC001
CAPSTAN MOTER DRIVE
(See Page 126)
SL-22 BOARD
IC501
DFG, DPG AMP REEL FG AMP
MT 5V
SS 4.9V
IC505
DRUM MOTOR DRIVE
IC501
ATF SERVO CLOG DETECT PB SP/LP DETECT
IC503 SERVO/MECHANISM CONTROL
IC510 LOADING MOTER DRIVE
IC502 LANC I/O
EVER 5V
WAKE UP
UNREG
5.6V REG
CURRENT LIMITER
PWR CONT
LANC OUT
LANC DC
LANC SIG
IC508
5V REG
EVER 5V
IC507
BATTERY IN DETECT
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
BATT IN
BACK UP VDD
RESET
LI PRE END
D501
LI 3V
IC506 MODE CONTROL (MASTER)
SYS RESET
LANC PWR ON
BATT IN
VDD
RESET
LI PRE END
VTR ON
CAM ON
K OUT 0
K OUT 1
K IN 5
Q509 5V REG
PS501
SS 5V
UNREG
MOTOR UNREG
CN950
CN501
CN502
CN505
VTR UNREG
SS 5V
VTR ON
CAM ON
LANC SIG
LANC DC
MOTOR UNREG
EVF 5V
AUDIO 5V
D 5V
D 4V
15V
-9V
CAM 5V
L962
L961
L960
VIDEO 5V
RP 4.9V
REU DC OUT
ELECTRIC VIEW FINDER
IC501
CRT DRIVE
VF-44 BOARD
(See Page 139)
CN501
CN562
W561
UNREG
EVF 4.9V
CK-47 BOARD
(See Page 135)
W560
CN540
S540 POWER VTR OFF CAMERA
PK-30 BOARD
(See Page 134)
CS-31 BOARD
(See Page 91, 96, 99, 103, 105)
(See Page 83)
CD-61 BOARD
IC901
CCD IMAGER
CN801
CN901
D5V
-9V
15V
V DRIVE
IC804
TIMING GENERATOR
IC801
S/H, AGC, SIGNAL SEPARATOR
IC805
A/D BIAS AMP
IC803
A/D CONVERTER
IC802
FOCUS PREDRIVER
IC706
D/A CONVERTER (EVR)
IC702
ON SCREEN DISPLAY
IC703
SYNC GENERATOR
IC704
OPD
IC705
CAMERA CORE (CAMERA SIGNAL PROCESS)
IC707
Q708
IC709 CAMERA CONTROL
A VREF
A VDD
VDD
VPP
CAM ON
Q702
3V REG
EE PROM (NON-VOLATILE) MEMORY
IC712
IC851, 852, 855
IRIS DRIVE
HALL AMP
HALL BIAS
ZOOM POSI AMP
AV REF
CN852
FOCUS RING
LENS BLOCK
FOCUS END FAR SENSOR
SENS VCC
CN851
FOCUS MOTOR DRIVE
IC853
ZOOM MOTOR DRIVE
IC854
EVER 5V
CN701
FOR CHECK
MT 5V
L716
L730
L732
L731
L733
L734
L717
L804
IC001
IC002
VIDEO(2) REC/PB AMP
AUDIO 4.9V
VIDEO 4.9V
EC RFU DC OUT
CN504
CN503
CN507
LI3V
SS 4.9V
VA-71 BOARD
(See Page 113, 118, 121)
CN202
CN201
IC201 ~ IC206
IC301, IC361
IC051 ~ IC054
Q990,991 CURRENT LIMITER
VIDEO (1) (Y/CHROMA PROCESS)
MIC 5V
AUDIO PROCESS
IC401
IC400
CN400
W570
LITHIUM BATTERY
CN575
W573
CN571
VK-22 BOARD
(See Page 134)
(See Page 133)
IC401
REMOTE CONTROL RECEIVER
IC400
MIC AMP
W400
MA-93 BOARD
REU DC OUT
J550(1/3) RFU DC OUT
CN550
PJ-45 BOARD
(See Page 133)

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


MA-93 BOARD
MIC
REMOTE
LITHIUM BATTERY
PK-30 BOARD
BEEP ON/OFF
REMOCON ON/OFF
VTR OFF CAM (PLAYER)
PJ-45 BOARD
ELECTROSTATICK GND
J550 PIN JACK
BU550 BUZZER
IN/OUT SW
EDIT ON/OFF
REC MODE LP/SP
VK-22 BOARD
REW
PB
FF
PAUSE
STOP
EJECT
REC
FFC-25
FFC-32
FFC-33
SW-200 BOARD
START/STOP
STBY
FP-510
FP-511
CHECK PIN
CS-31 BOARD
FP-488 BOARD (FLEXIBLE)
FOCUS ENB SENSOR
M905 FOCUS MOTOR
M906 ZOOM MOTOR
M904 IRIS MOTOR
ZOOM POSITION
INNER FOCUS LENS
AF ON/OFF
FOCUS RING
CD-61 BOARD
IC901 CCD IMAGER
FP-558
S001~S004
ZOOM SWITCH UNIT
SL-22 BOARD
FP-441
FP-437
FP-442
M901 DRUM MOTOR
M903 LOADING MOTOR
LM-40 BOARD
S001 MODE SWITCH
R009 DEW SENSOR
FP-442 BOARD (FLEXIBLE)
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR


10
11
12
13
14
15
16
17
18
19
20
BEEP ON/OFF
S541
REMOCON ON/OFF
S542
VTR OFF CAM (PLAYER)
S540
PK-30 BOARD
CN540 MON ZIF
ZERO MEMO
RESET
S562
S561
S563
TAPE/BATT CHECK
DK-20 BOARD
W564
ELECTROSTATIC GND
FP-510
S564 DATE
S565 TIME
S566 EVENT
S567 BACK LIGHT
S568 FADER
S560 PROGRAM AE
CN562 L 9MT
EVF 4.9
EVF GND
EVF OUT
TALLY
K IN 3
K IN 4
K OUT 0
W560
CK-47 BOARD
W561
FFC-23
VA-71 BOARD
CN201 B TO B
CN503 B TO B
CN505 0.8MM MON ZIF
V901 PICTURE TUBE
CRT
W501 SMK I 1.5MM
G1
H1
H2
N.C.
G2
G3
EDIT SEARCH
S502 (-)
(+) S501
CN502 SMK I 1.5MM
DV1
DV2
CN503 SMK I 1.5MM
DH1
DH2
CN501 JST 1
VF-44 BOARD
< VS-156 >
S580
S581 STBY
CN502 L 0.8MM
CN002 13P 0.8MM
CN001 5P 1.5MM
CHECK PIN
CN501 48P 0.8MM
CN950 48P 0.8MM
J951 REMOTE
J952 EARPHONE
J950 (EASY CONNECTION)
PS-282 BOARD
FP-600
W500
FP-426
CN502
FP-437
FP-442
CN503 15P
FP-443
CN003 0.8MM 6P
S001 MODE SWITCH
R009 DEW SENSOR
FP-442 BOARD (FLEXIBLE)
CN001 0.8MM 15P
S002
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR
D001 T/E LED
Q001 TAPE TOP SENSOR
LS-33 BOARD
CN004 6P
IC001
M902 CAPSTAN MOTOR
FLYING ERASE
2CH
1CH
A-MECHA
M903 MOTOR
-40 BOARD

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○ : Through hole
- ▨ : Pattern from the side which enables seeing. (The other layer's patterns are not indicated.)

* Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

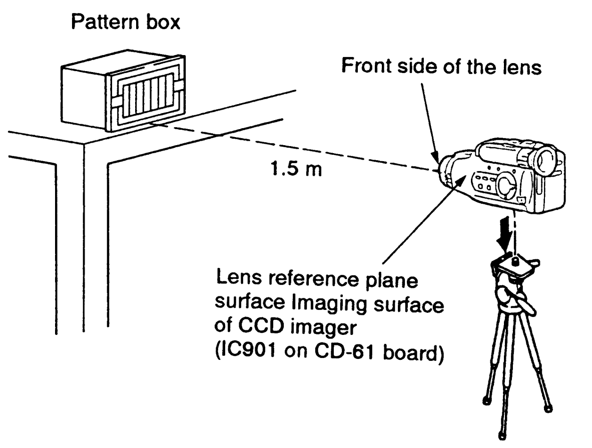
- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.*
- ━ : B+ Line.*
- - - - : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:
The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

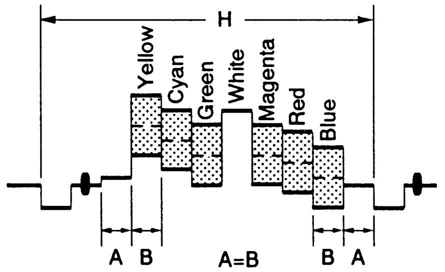
- **Measuring conditions voltage value and waveform. (CAMERA, DIGITAL TITLE block)**
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection



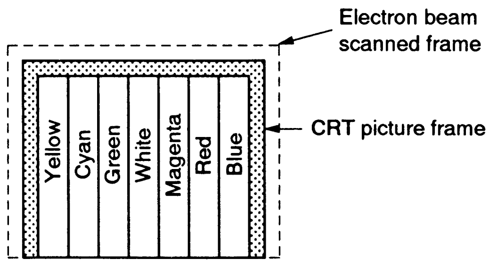
Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-61 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.



H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A

Fig. a (Video output terminal output waveform)



Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, VIEW FINDER block)

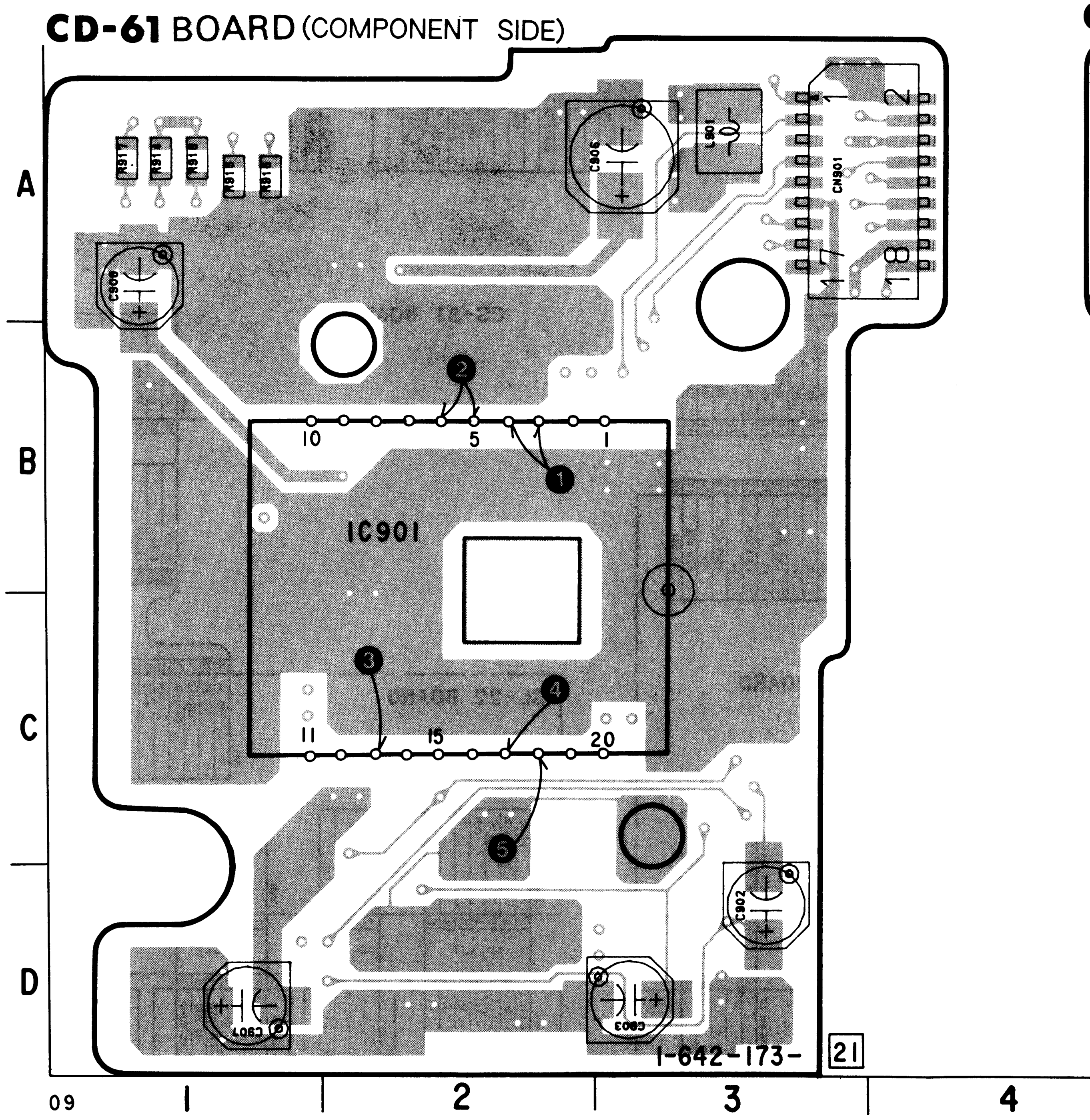
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

*: indicated by the color red.

CD-61 (CCD DRIVE) PRINTED WIRING BOARD

— Ref. No. CD-61 BOARD: 1000 series —

CD-61 BOARD (COMPONENT SIDE)



A
B
C
D
09
1
2
3
4
IC901
CN901
L901
C906
C909
C902
C903
C907
1
2
17
18
10
5
1
11
15
20
①
②
③
④
⑤
1-642-173-
21

(DIODE)

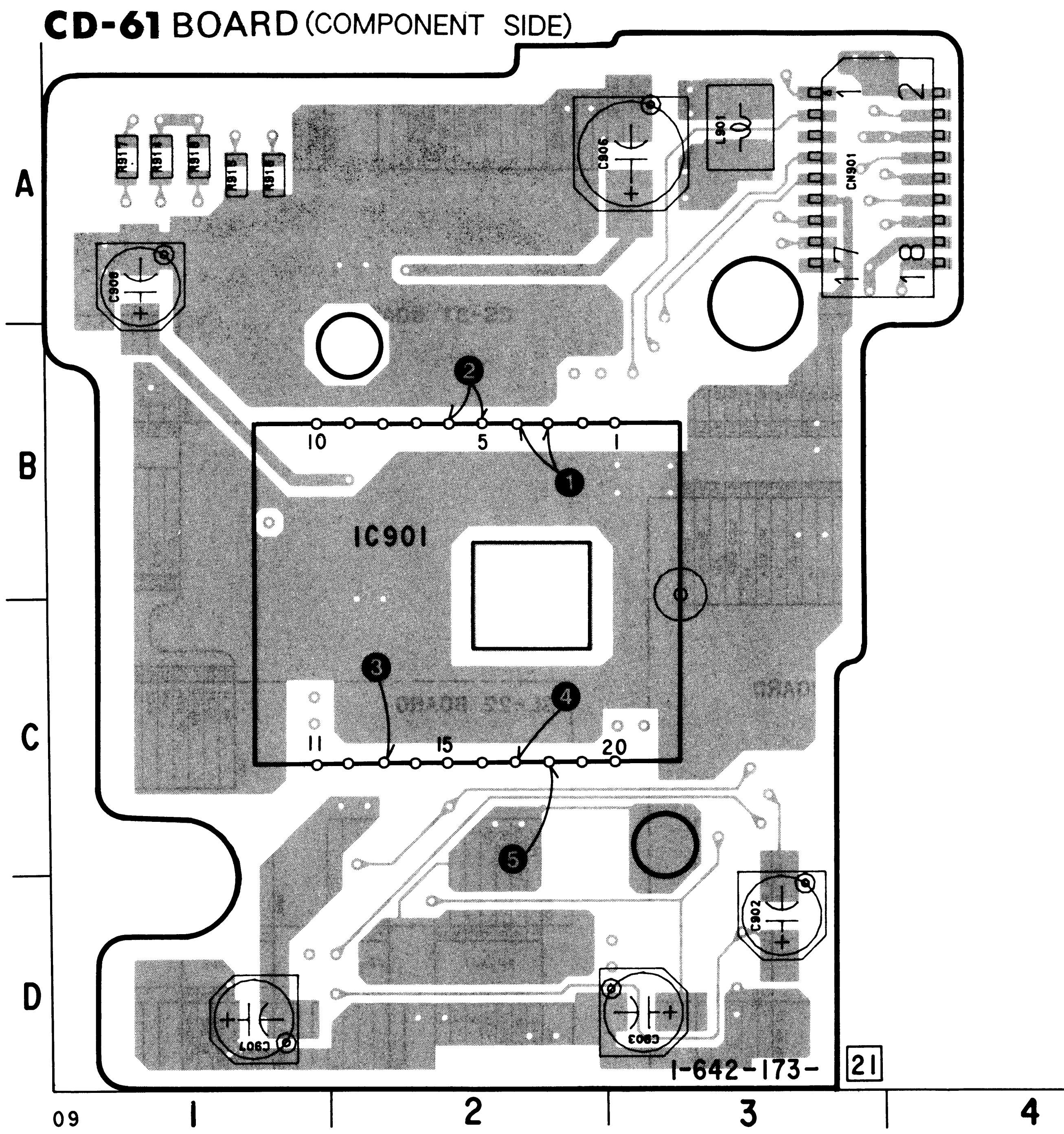
D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

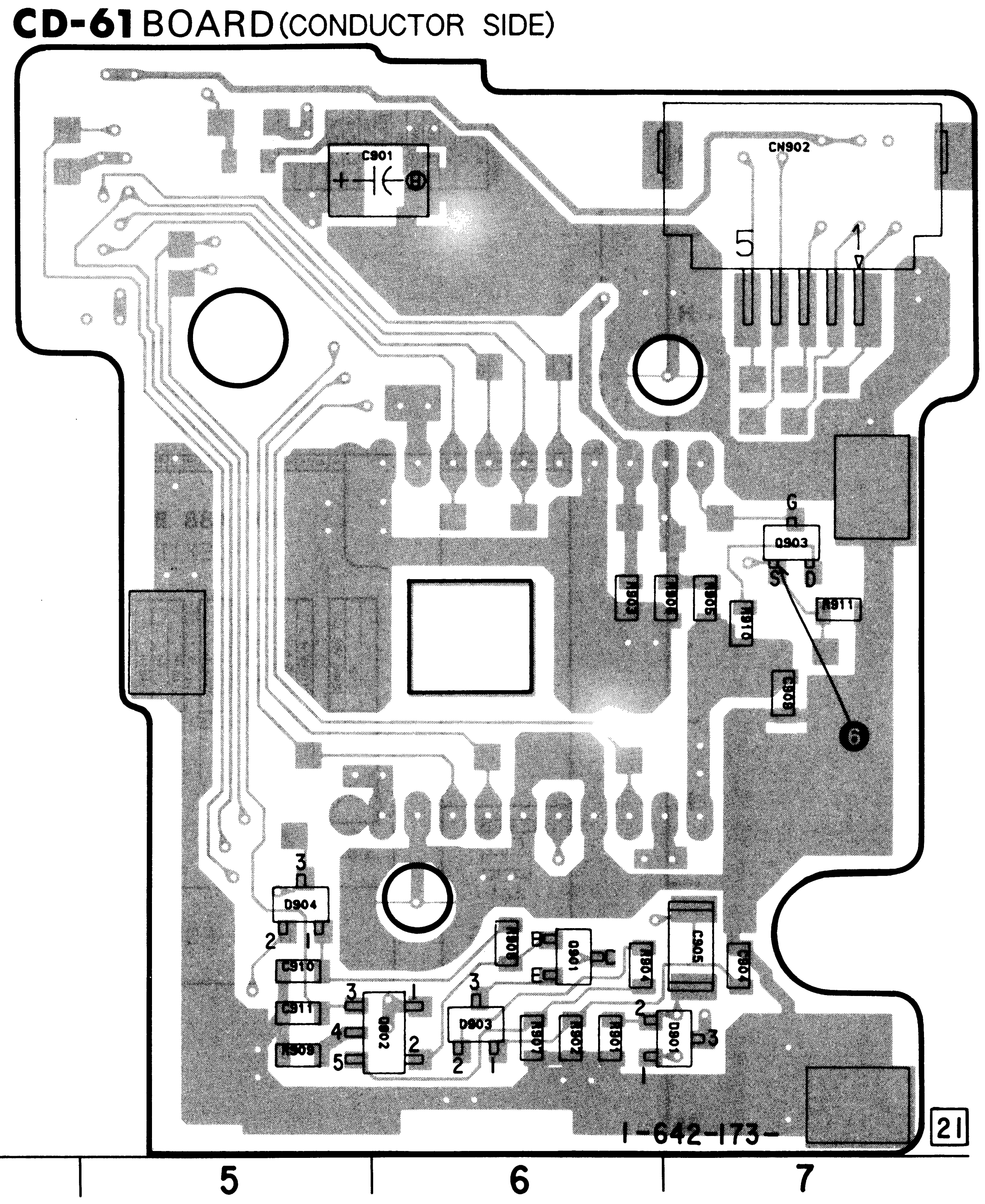
(TRANSISTOR)

Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875

CD-61 (CCD DRIVE) PRINTED WIRING BOARD

— Ref. No. CD-61 BOARD: 1000 series —


CD-61 BOARD (COMPONENT SIDE)
A
B
C
D
C906
L901
CN901
1
2
17
18
C908
IC901
10
5
1
11
15
20
①
②
③
④
⑤
C902
C907
C903
1-642-173-
21
09
1
2
3
4


CD-61 BOARD (CONDUCTOR SIDE)
C901
CN902
5
1
Q903
G
S
D
R903
R904
R905
R910
R911
⑥
D904
C910
C911
R909
Q902
Q901
D903
D901
R908
R907
R902
R901
C905
C904
1-642-173-
21
5
6
7

(DIODE)

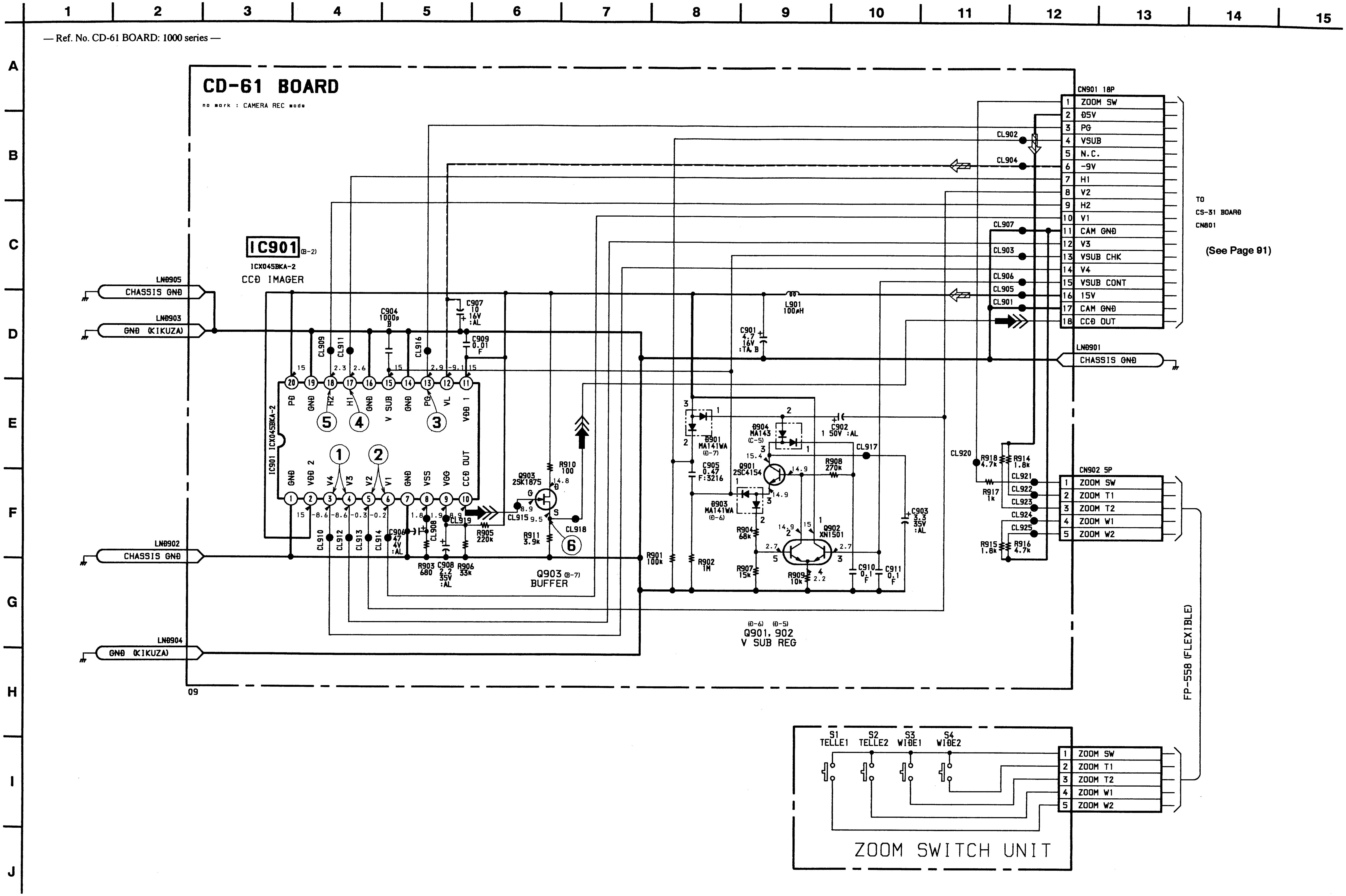
D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

(TRANSISTOR)

Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875

CD-61 (CCD DRIVE) SCHEMATIC DIAGRAM

— Ref. No. CD-61 BOARD: 1000 series —



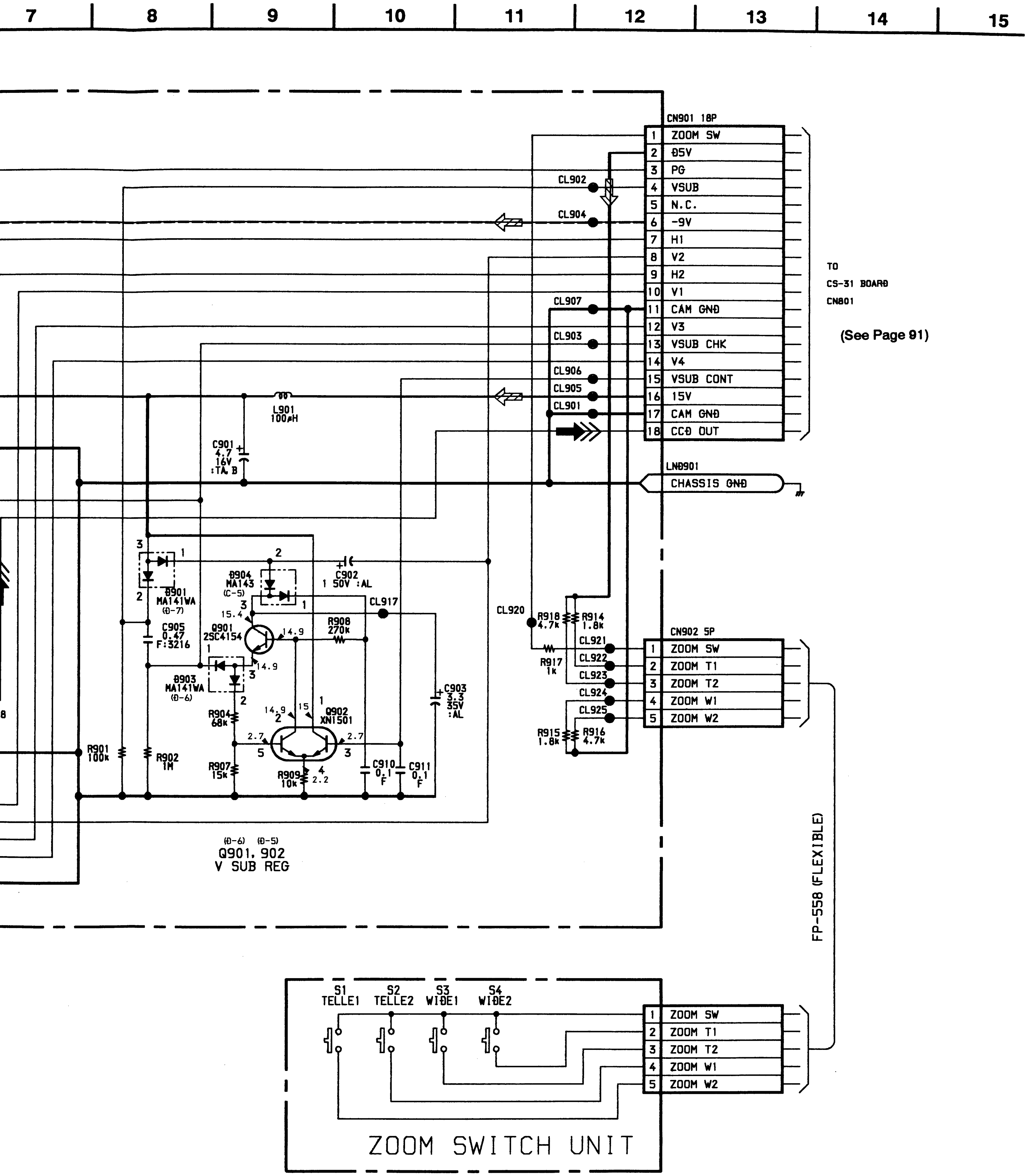
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
CD-61 BOARD
no mark : CAMERA REC mode
IC901 (B-2)
ICX045BKA-2
CCD IMAGER
IC901 ICX045BKA-2
PG
GND
H2
H1
GND
V SUB
GND
PG
VL
VDD 1
GND
VDD 2
V4
V3
V2
V1
GND
VSS
VGG
CCD OUT
①
②
③
④
⑤
⑥
LN0905
CHASSIS GND
LN0903
GND (KIKUZA)
LN0902
CHASSIS GND
LN0904
GND (KIKUZA)
C904 1000p B
C907 10 16V :AL
C909 0.01 F
CL909
CL911
CL916
CL910
CL912
CL913
CL914
C906 47 4V :AL
CL908
CL919
R903 680
C908 2.2 35V :AL
R906 33k
R905 220k
Q903 2SK1875
CL915
R911 3.9k
R910 100
CL918
Q903 (B-7) BUFFER
R901 100k
R902 1M
C901 4.7 16V :TA B
L901 100μH
D901 MA141WA (D-7)
C905 0.47 F:3216
D904 MA143 (C-5)
Q901 2SC4154
D903 MA141WA (D-6)
R904 68k
R907 15k
R909 10k
C902 1 50V :AL
R908 270k
CL917
Q902 XN1501
C903 3.3 35V :AL
C910 0.1 F
C911 0.1 F
(D-6) (D-5)
Q901, 902
V SUB REG
CN901 18P
1 ZOOM SW
2 D5V
3 PG
4 VSUB
5 N.C.
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GND
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GND
18 CCD OUT
CL902
CL904
CL907
CL903
CL906
CL905
CL901
LN0901
CHASSIS GND
TO
CS-31 BOARD
CN801
(See Page 91)
CL920
R918 4.7k
R914 1.8k
R917 1k
CL921
CL922
CL923
CL924
CL925
R915 1.8k
R916 4.7k
CN902 5P
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
FP-558 (FLEXIBLE)
S1 TELLE1
S2 TELLE2
S3 WIDE1
S4 WIDE2
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
ZOOM SWITCH UNIT
09

Note on the CC

- Some of this
imager (IC901
The correction
of the camera
also written o
(upper) of the
The correction
supplied for
imager to whic
data label and
the camera mi
for input metho
- The CCD ima
CD-61 board s
When replacin
from the old b
- Perform all ad
imager has bee
- Handle the CC
may be broken
Also, prevent
and strong ligh

- **SIGNAL PAT**

	CHRO
REC	
PB	


7
8
9
10
11
12
13
14
15
CN901 18P
1 ZOOM SW
2 θ5V
3 PG
4 VSUB
5 N.C.
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GND
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GND
18 CCD OUT
CL902
CL904
CL907
CL903
CL906
CL905
CL901
TO
CS-31 BOARD
CN801
(See Page 91)
L901
100μH
C901
4.7
16V
:TA B
LND901
CHASSIS GND
D901
MA141WA
(D-7)
C905
0.47
F:3216
D904
MA143
(C-5)
C902
1 50V :AL
CL917
Q901
2SC4154
R908
270k
D903
MA141WA
(D-6)
R904
68k
Q902
XN1501
C903
3.3
35V
:AL
R901
100k
R902
1M
R907
15k
R909
10k
C910
0.1
F
C911
0.1
F
CL920
R918
4.7k
R914
1.8k
R917
1k
CL921
CL922
CL923
CL924
CL925
R915
1.8k
R916
4.7k
CN902 5P
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
(D-6) (D-5)
Q901, 902
V SUB REG
FP-558 (FLEXIBLE)
S1 TELLE1
S2 TELLE2
S3 WIDE1
S4 WIDE2
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
ZOOM SWITCH UNIT

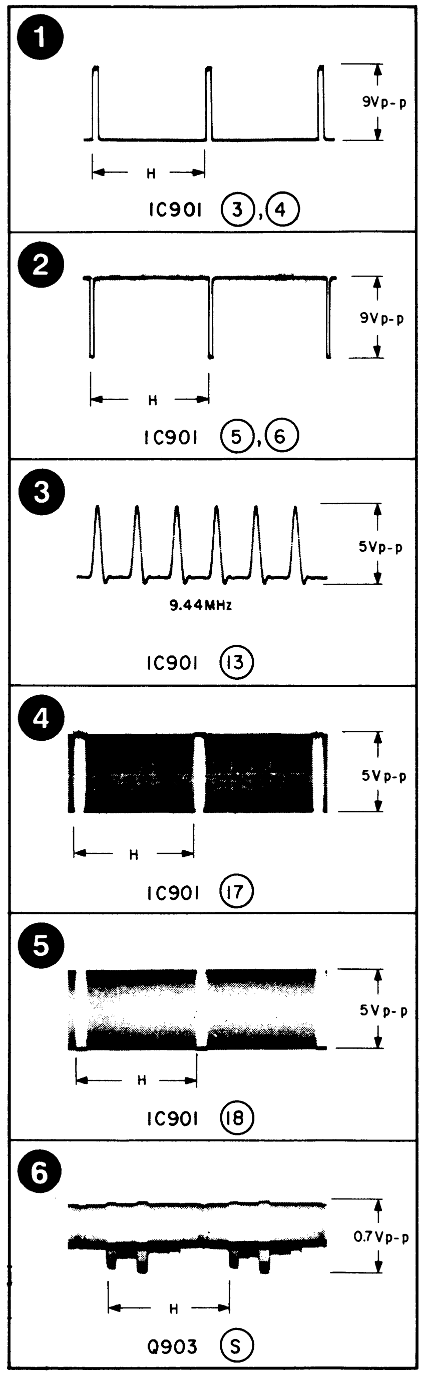
Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-61 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on CS-31 board), and also written on the CCD data label put on the shield case (upper) of the PS-282 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-61 board supplied as the repair parts.
  When replacing the CD-61 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	
PB				

CD-61 BOARD



CS-31 (CAMERA, REC/PB AMP, SERVO/SYSTEM CONTROL), FP-488 (INNER FOCUS LENS) PRINTED WIRING BOARDS

— Ref. No. CS-31 BOARD: 1000 series —

〈 DIODE 〉

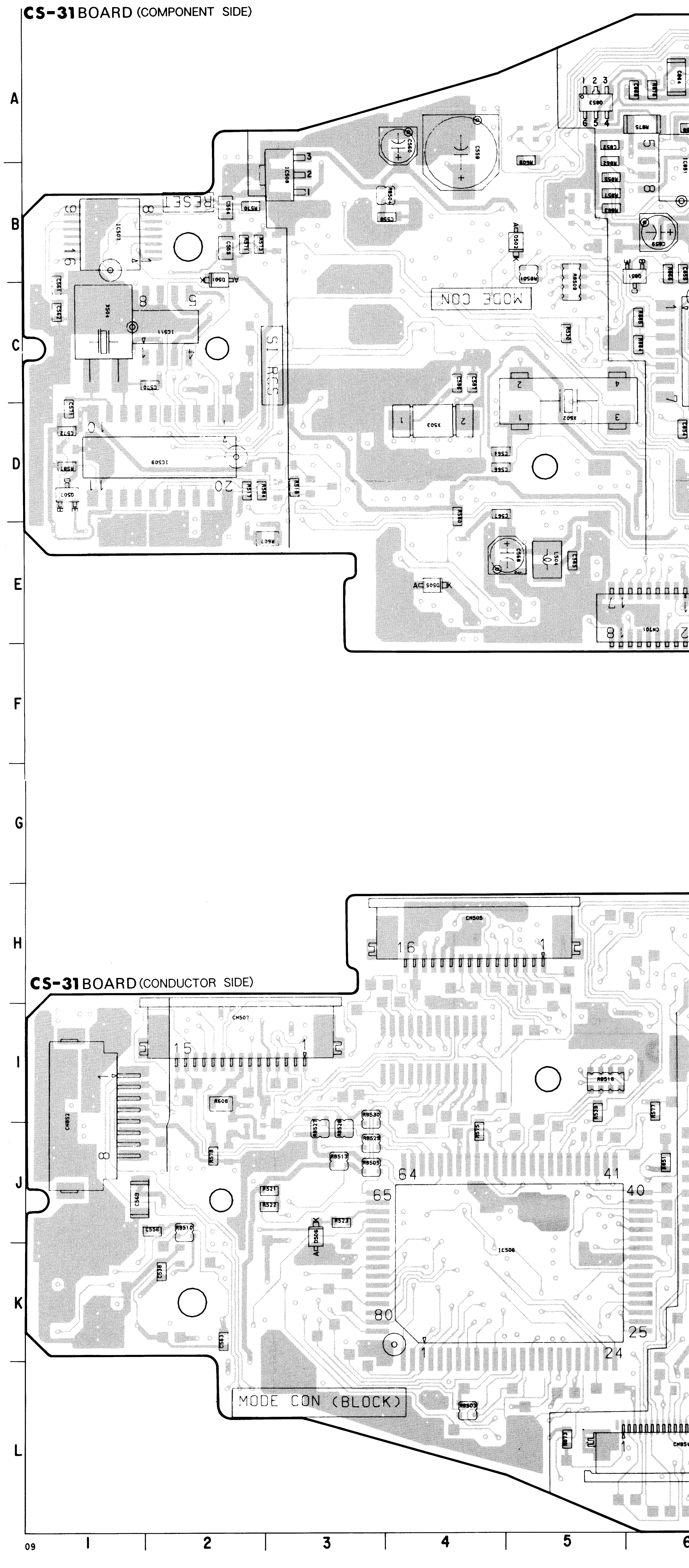
⚠D501	8-719-421-27	DIODE	MA728
D502	8-719-404-46	DIODE	MA110
D503	8-719-977-34	DIODE	DTZ12
D504	8-719-941-86	DIODE	DAN202U
D505	8-719-422-07	DIODE	MA8082
D506	8-719-422-07	DIODE	MA8082
D507	8-719-404-46	DIODE	MA110

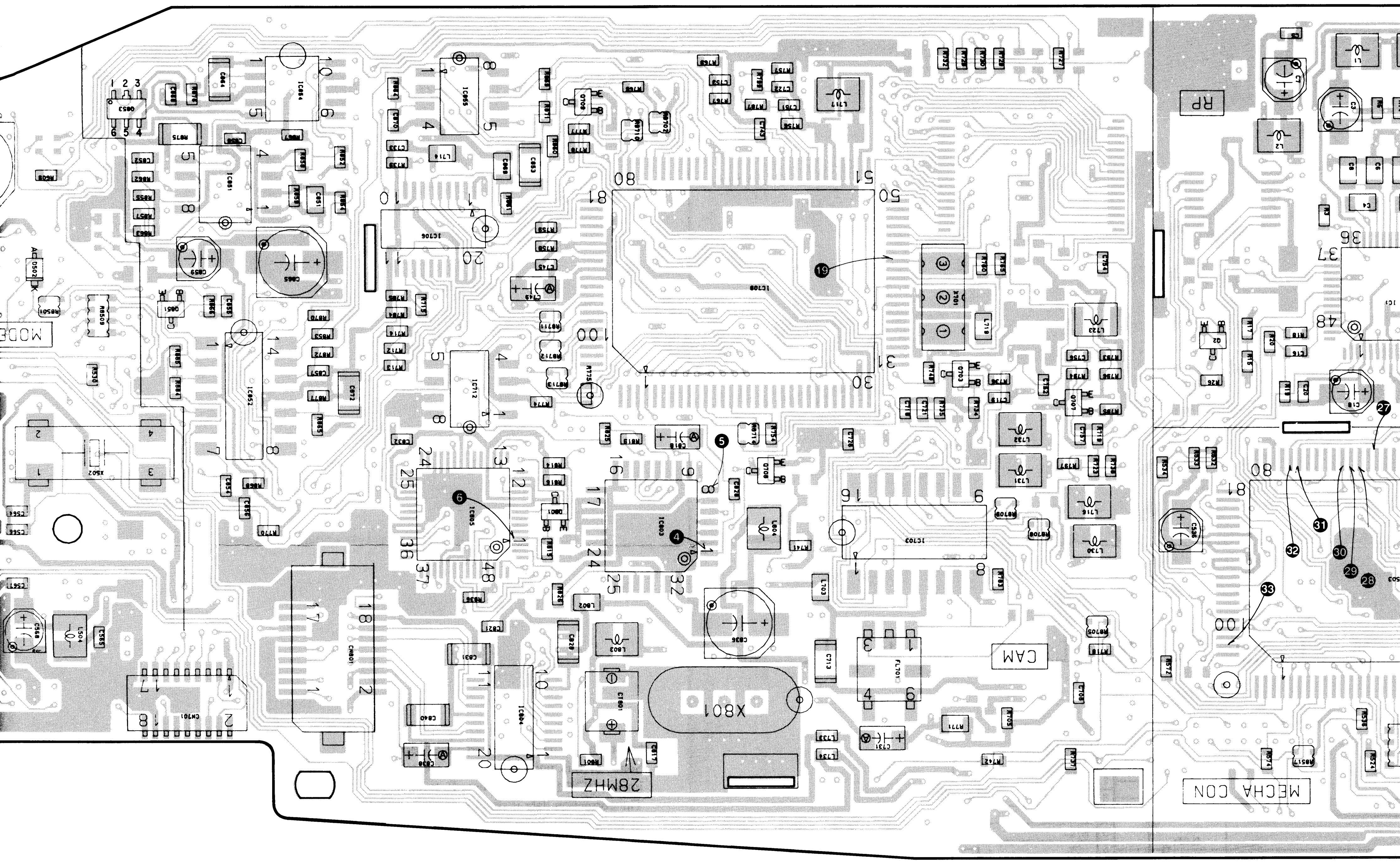
〈 IC 〉

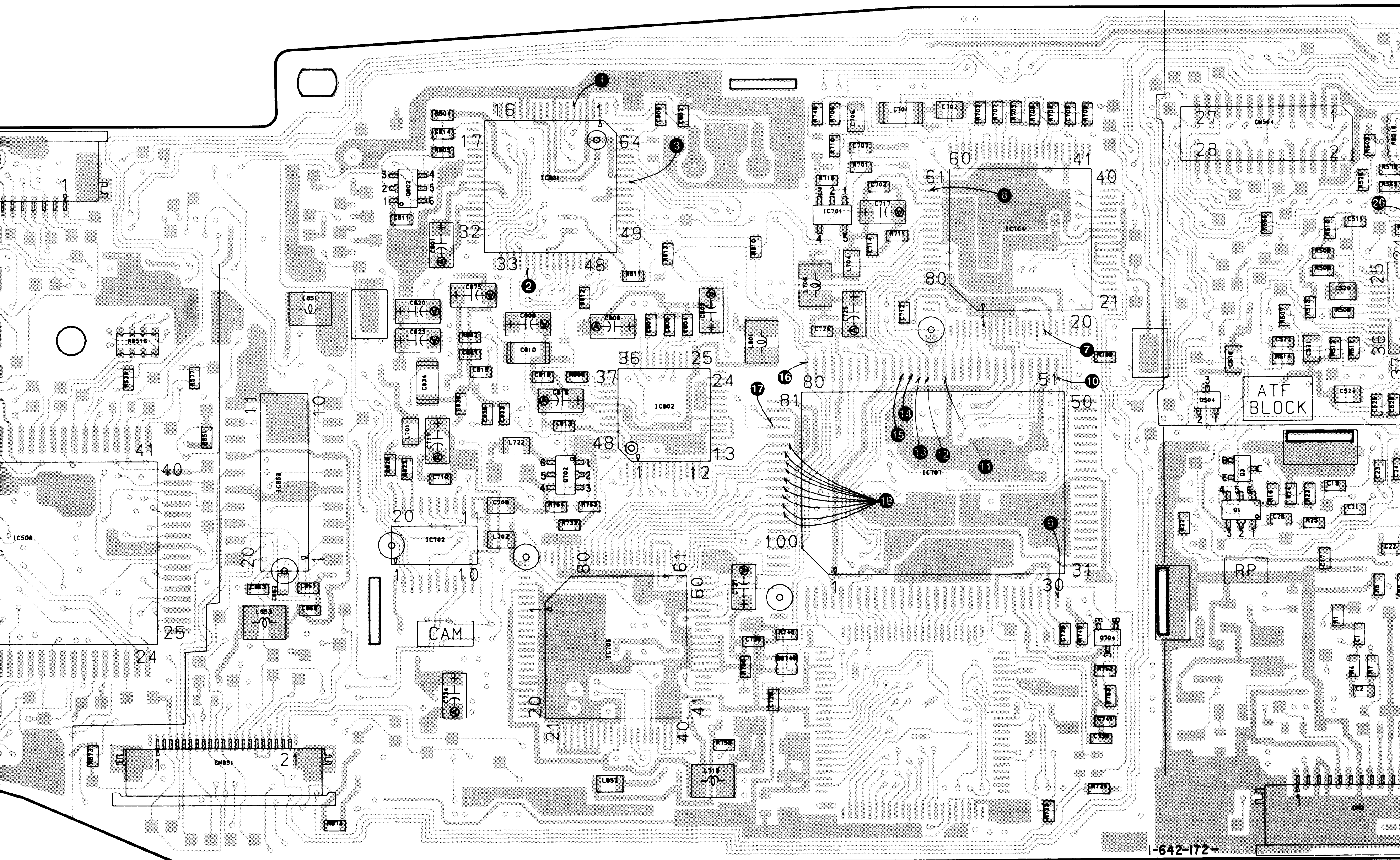
IC001	8-752-058-14	IC	CXA1202R
IC501	8-759-058-96	IC	TB1206F
IC502	8-759-999-02	IC	TL1596CDB
IC503	8-752-838-46	IC	CXP80624-410Q
IC505	8-759-990-55	IC	CXA8006M
IC506	8-759-088-92	IC	uPD75316GF-303-3B9
IC507	8-759-511-22	IC	CXA1448N
IC508	8-759-512-69	IC	S-81350HG-KD
IC509	8-759-145-63	IC	uPD7564G-540
IC510	8-759-039-01	IC	MPC1720M
IC511	8-759-044-78	IC	AK6420F
IC701	8-759-031-58	IC	SC7SU04F
IC702	8-759-635-27	IC	M62352GP
IC703	8-759-069-29	IC	uPD6456GS-618
IC704	8-752-348-92	IC	CXD2101AR
IC705	8-759-063-18	IC	CXD2103AR
IC706	8-752-337-36	IC	CXD2104N
IC707	8-752-337-32	IC	CXD2100Q
IC709	8-752-837-59	IC	CXP80624-299Q
IC712	8-759-044-78	IC	AK6420F
IC801	8-752-337-34	IC	CXD1257R
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-981-82	IC	RC3414M
IC852	8-759-998-96	IC	LM324D
IC853	8-759-038-81	IC	MPC1724M
IC854	8-759-823-51	IC	LB1830M
IC855	8-759-998-98	IC	LM358D

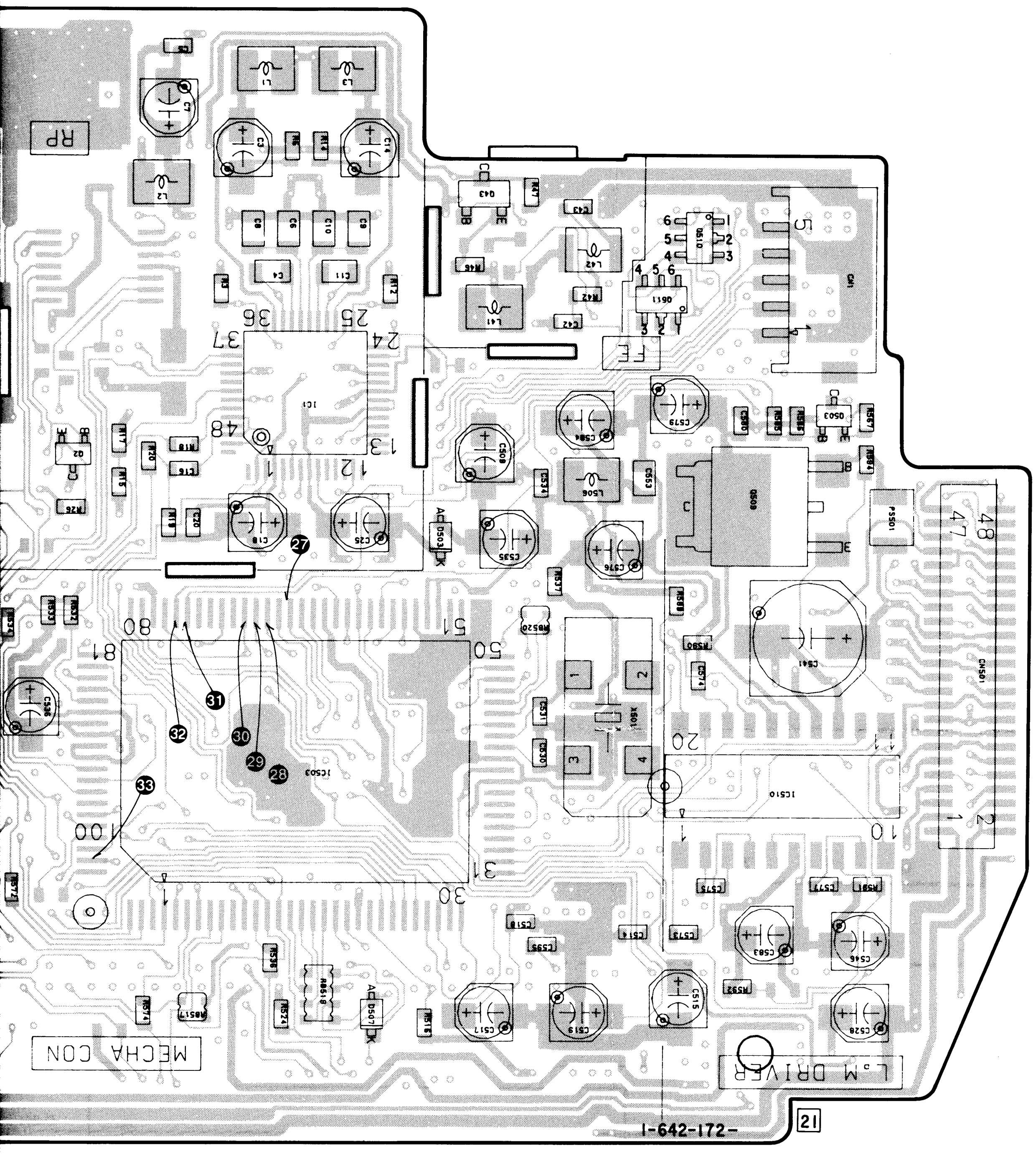
〈 TRANSISTOR 〉

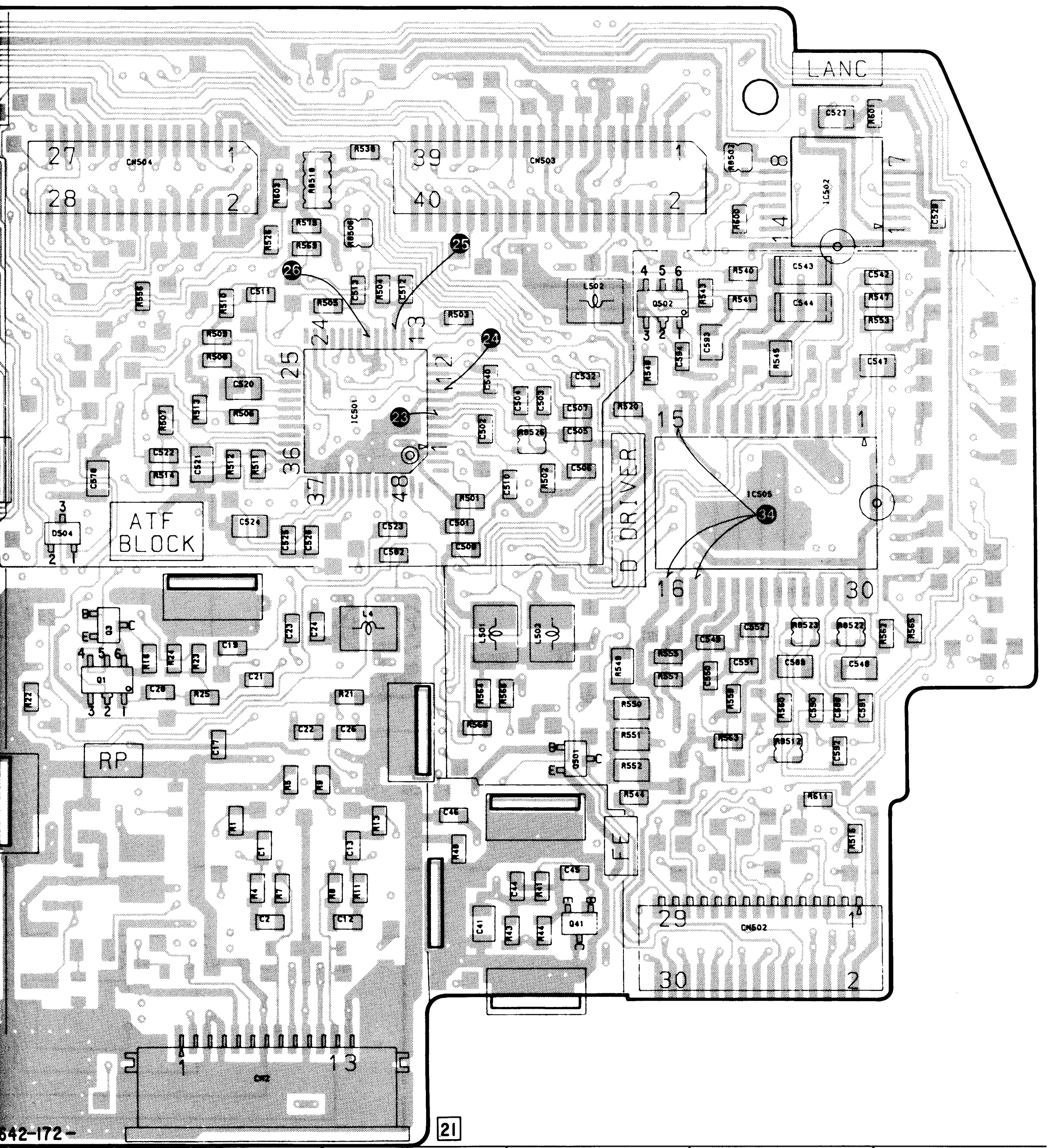
Q001	8-729-420-20	TRANSISTOR	XN4312
Q002	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q003	8-729-905-12	TRANSISTOR	DTA144EU
Q041	8-729-905-23	TRANSISTOR	2SA1576-R
Q043	8-729-216-22	TRANSISTOR	2SA1162-G
Q501	8-729-907-00	TRANSISTOR	DTC114EU
Q502	8-729-402-78	TRANSISTOR	XN6401
Q503	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q507	8-729-905-12	TRANSISTOR	DTA144EU
Q509	8-729-822-84	TRANSISTOR	2SB1202FAST
Q510	8-729-402-81	TRANSISTOR	XN4501
Q511	8-729-402-81	TRANSISTOR	XN4501
Q702	8-729-402-84	TRANSISTOR	XN4601
Q703	8-729-010-60	TRANSISTOR	MSA1586-BC
Q704	8-729-010-60	TRANSISTOR	MSA1586-BC
Q707	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q708	8-729-920-XX	TRANSISTOR	DTA114EU
Q709	8-729-905-61	TRANSISTOR	DTC124EU
Q801	8-729-423-52	TRANSISTOR	2SC3931-C
Q802	8-729-403-27	TRANSISTOR	XN4401
Q851	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q853	8-729-403-27	TRANSISTOR	XN4401



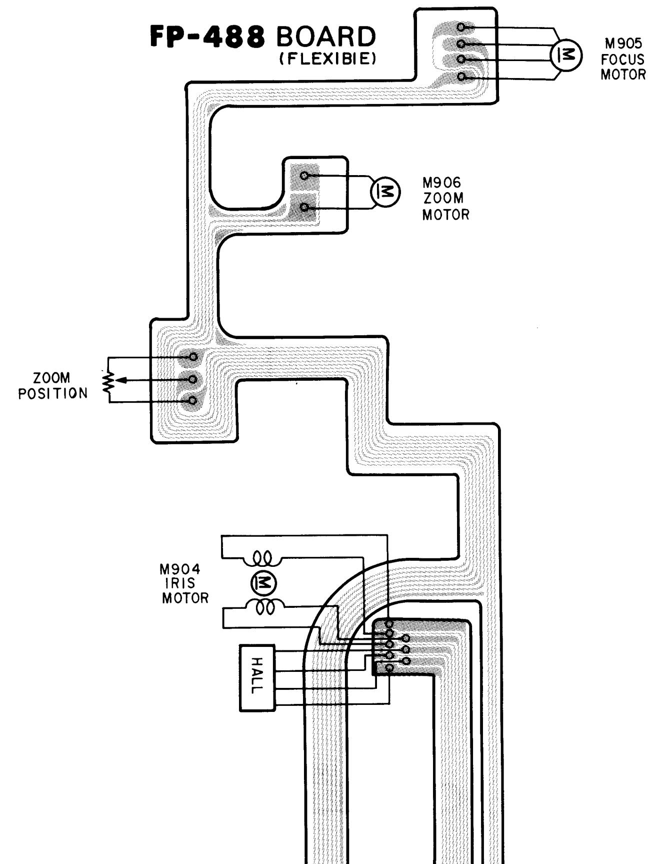

MODE
CAM
28MHZ
X801
RP
MECHA CON
IC708
IC703
IC801
IC802
IC803
IC804
IC805
IC806
IC852
CN801
CN701
FL701


IC901
IC902
IC701
IC702
IC704
IC705
IC707
IC506
IC853
CN851
CN504
CAM
RP
ATF BLOCK
CN2
1-642-172-
5
6
7
8
9
10
11
12
13
14


RP
MECHA CON
L M DRIVER
FE
IC503
IC510
IC1
CN501
1-642-172-
21

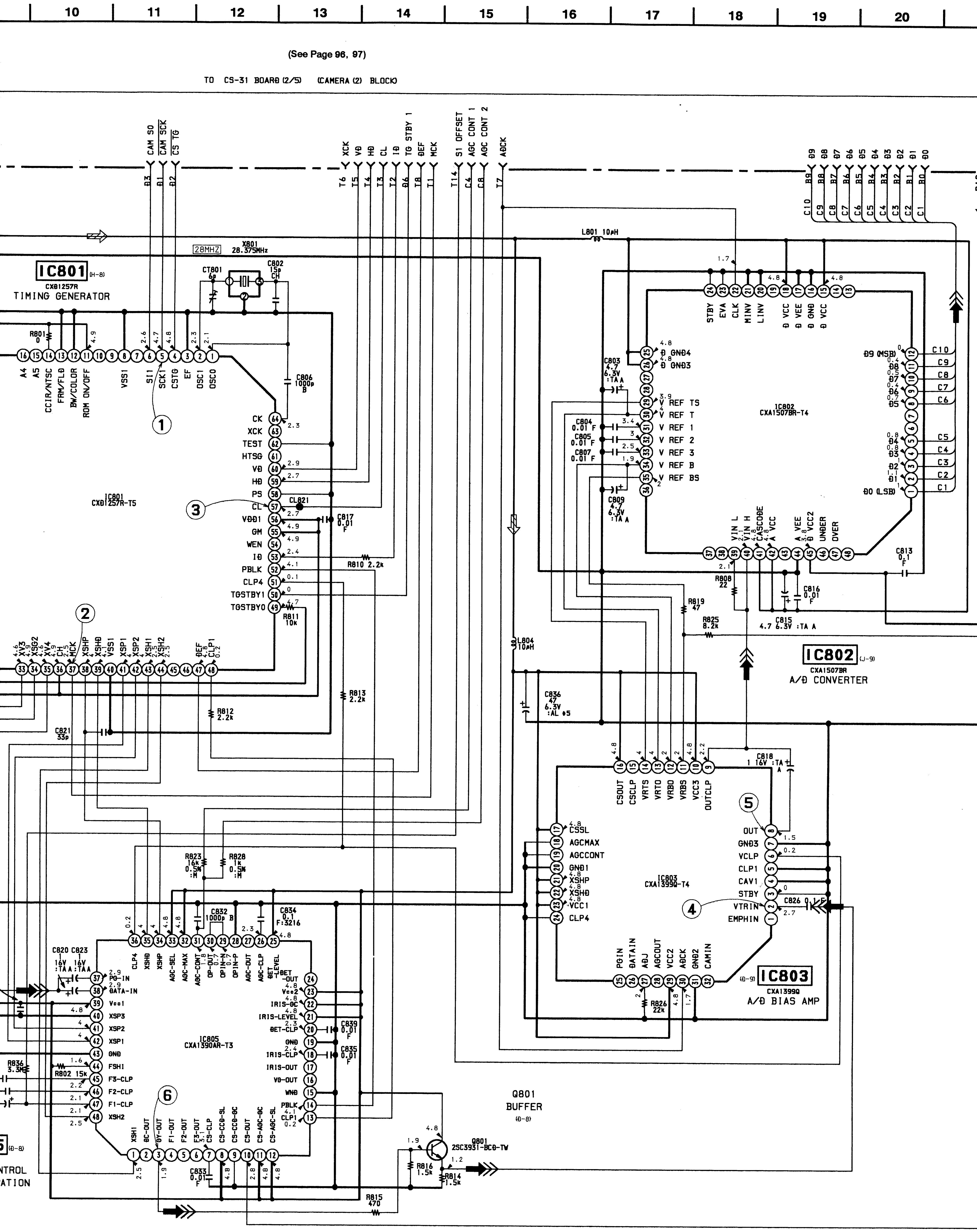

LANC
CN504
CN503
IC502
IC501
IC505
ATF BLOCK
D DRIVER
RP
FE
CN502
CN2
642-172-
21
13
14
15
16
17
18

FP-488 BOARD (FLEXIBIE)


M905
FOCUS
MOTOR
M906
ZOOM
MOTOR
ZOOM
POSITION
M904
IRIS
MOTOR
HALL
FOCUS
END
SENSOR
1
21

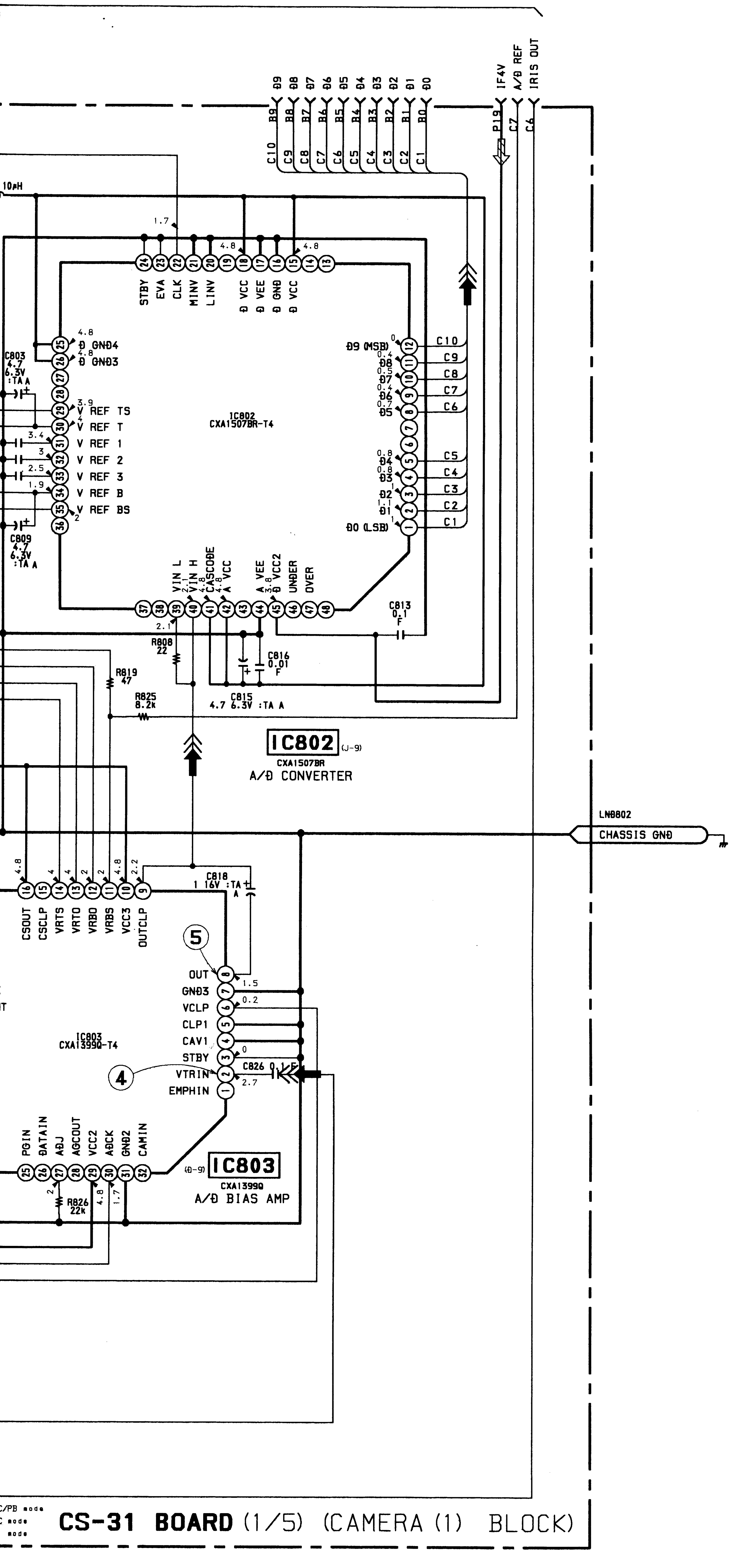
(See Page 96, 97)

TO CS-31 BOARD (2/5) (CAMERA (2) BLOCK)


10
11
12
13
14
15
16
17
18
19
20
CAM SO
CAM SCK
CS TG
XCK
VD
HD
CL
ID
TG STBY 1
DEF
MCK
S1 OFFSET
AGC CONT 1
AGC CONT 2
ADCK
D9
D8
D7
D6
D5
D4
D3
D2
D1
D0
IC801
CXD1257R
TIMING GENERATOR
IC801
CXD1257R-T5
X801
28.375MHz
28MHZ
CT801
C802
R801
CCIR/NTSC
FRM/FLD
BW/COLOR
ROM ON/OFF
VSS1
SI1
SCK1
CSTG
EF
OSC1
OSCO
CK
XCK
TEST
HTSG
VD
HD
PS
CL
VDD1
GM
WEN
ID
PBLK
CLP4
TGSTBY1
TGSTBY0
CL821
C817
R810 2.2k
R811 10k
XV3
XSG2
XV4
CH
MCK
XSHP
XSHD
VSS1
XSP1
XSP2
XSH1
XSH2
DEF
CLP1
C806 1000p
L801 10µH
L804 10µH
IC802
CXA1507BR
A/D CONVERTER
IC802
CXA1507BR-T4
STBY
EVA
CLK
MINV
LINV
D VCC
D VEE
D GND
D VCC
D GND4
D GND3
V REF TS
V REF T
V REF 1
V REF 2
V REF 3
V REF B
V REF BS
D9 (MSB)
D0 (LSB)
VIN L
VIN H
CASCODE
A VCC
A VEE
D VCC2
UNDER
OVER
C803
C804
C805
C807
C809
C813
C815
C816
R808 22
R819 47
R825 8.2k
C836
R813 2.2k
R812 2.2k
C821 33p
IC803
CXA1399Q
A/D BIAS AMP
IC803
CXA1399Q-T4
CSOUT
CSCLP
VRTS
VRTO
VRBO
VRBS
VCC3
OUTCLP
CSSL
AGCMAX
AGCCONT
GND1
XSHP
XSHD
VCC1
CLP4
OUT
GND3
VCLP
CLP1
CAV1
STBY
VTRIN
EMPHIN
PGIN
DATAIN
ADJ
AGCOUT
VCC2
ADCK
GND2
CAMIN
C818
C826
R826 22k
R823 16k
R828 1k
C832 1000p
C834
IC805
CXA1390AR-T3
CLP4
XSHD
XSHP
AGC-SEL
AGC-MAX
AGC-CONT
OP-OUT
OPIN-N
OPIN-P
AGC-CLP
DET-LEVEL
DET-OUT
Vcc2
IRIS-DC
IRIS-LEVEL
DET-CLP
GND
IRIS-CLP
IRIS-OUT
VD-OUT
WND
PBLK
CLP1
PG-IN
DATA-IN
Vcc1
XSP3
XSP2
XSP1
GND
FSH1
F3-CLP
F2-CLP
F1-CLP
XSH2
XSH1
DC-OUT
DY-OUT
F1-OUT
F2-OUT
F3-OUT
CS-CLP
CS-CD-SL
CS-CD-DC
CS-OUT
CS-AGC-DC
CS-AGC-SL
C820
C823
C833
C835
C839
R836 3.3k
R802 15k
Q801
BUFFER
Q801
2SC3931-BCD-TW
R816 1.5k
R814 1.5k
R815 470
①
②
③
④
⑤
⑥
NTROL
ATION

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

CS-31 BOARD (1/5) (CAMERA (1) B


Ð9 Ð8 Ð7 Ð6 Ð5 Ð4 Ð3 Ð2 Ð1 Ð0
B9 B8 B7 B6 B5 B4 B3 B2 B1 B0
C10 C9 C8 C7 C6 C5 C4 C3 C2 C1
IF4V
A/Ð REF
IRIS OUT
P19
C7
C6
10μH
1.7
4.8
STBY
EVA
CLK
MINV
LINV
Ð VCC
Ð VEE
Ð GNÐ
Ð VCC
Ð GNÐ4
Ð GNÐ3
C803 4.7 6.3V :TA A
V REF TS
V REF T
V REF 1
V REF 2
V REF 3
V REF B
V REF BS
C809 4.7 6.3V :TA A
IC802 CXA1507BR-T4
Ð9 (MSB)
Ð8
Ð7
Ð6
Ð5
Ð4
Ð3
Ð2
Ð1
Ð0 (LSB)
VIN L
VIN H
CASCOÐE
A VCC
A VEE
Ð VCC2
UNÐER
OVER
C813 0.1 F
R808 22
C816 0.01 F
R819 47
R825 8.2k
C815 4.7 6.3V :TA A
IC802 (J-9) CXA1507BR A/Ð CONVERTER
LNØ802
CHASSIS GNÐ
CSOUT
CSCLP
VRTS
VRTO
VRBO
VRBS
VCC3
OUTCLP
C818 1 16V :TA A
5
OUT
GNÐ3
VCLP
CLP1
CAV1
STBY
VTRIN
EMPHIN
1.5
0.2
0
2.7
C826 0.1 F
4
IC803 CXA1399Q-T4
PGIN
BATAIN
AÐJ
AGCOUT
VCC2
AÐCK
GNÐ2
CAMIN
R826 22k
IC803 (D-9) CXA1399Q A/Ð BIAS AMP

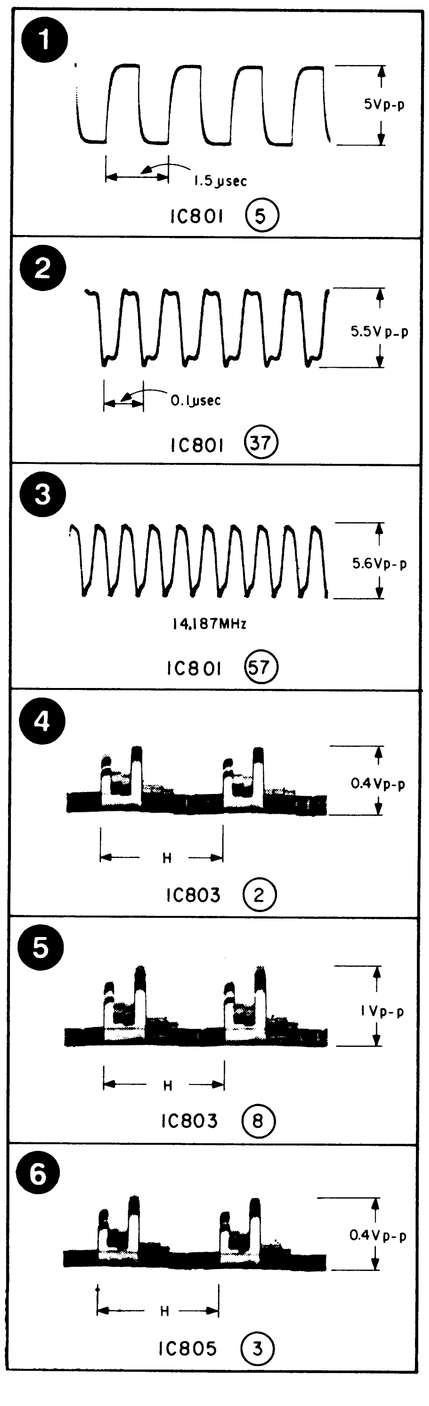
C/PB mode
C mode
mode

CS-31 BOARD (1/5) (CAMERA (1) BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	
PB				

CS-31 BOARD (1/5)

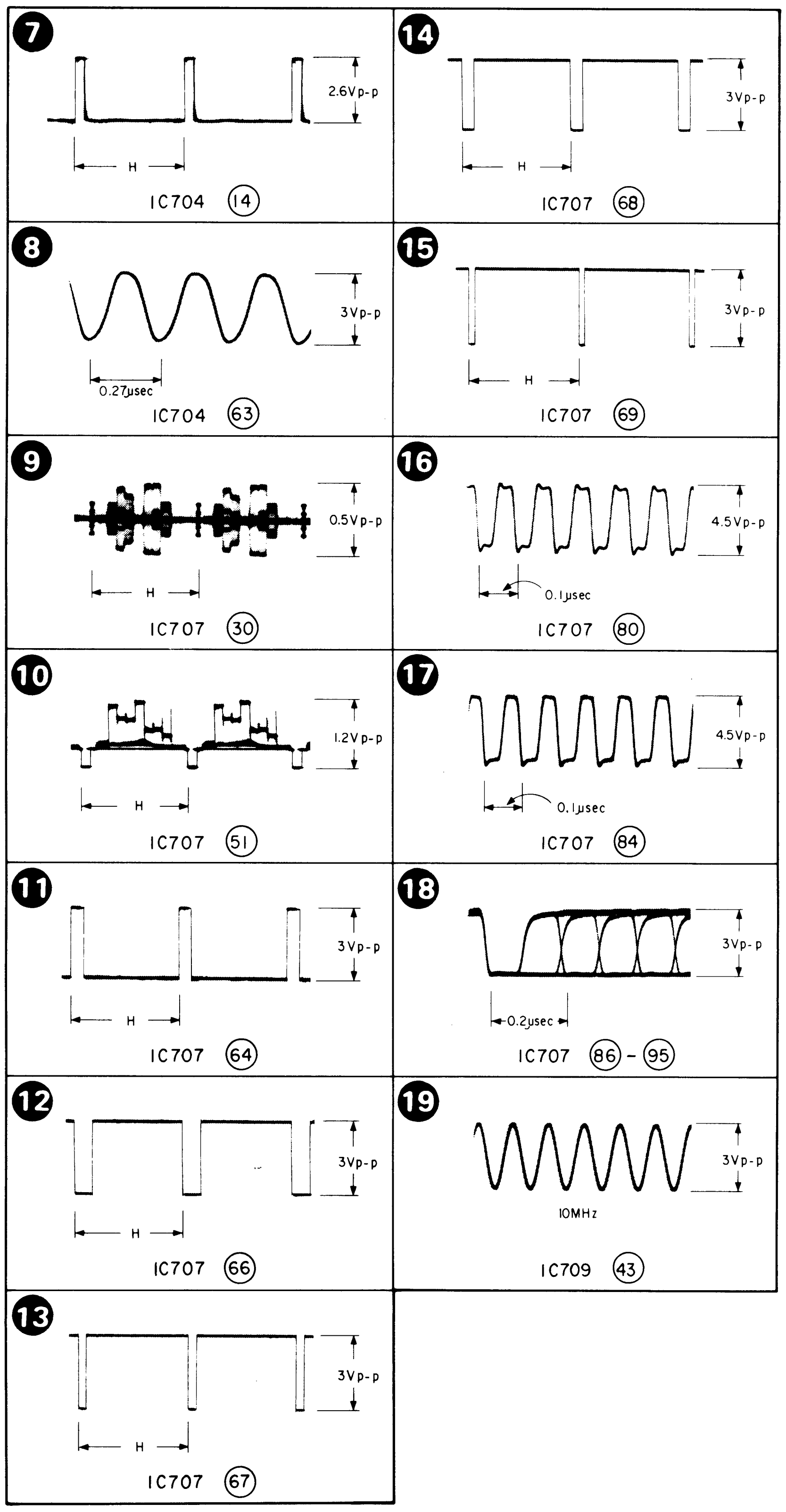


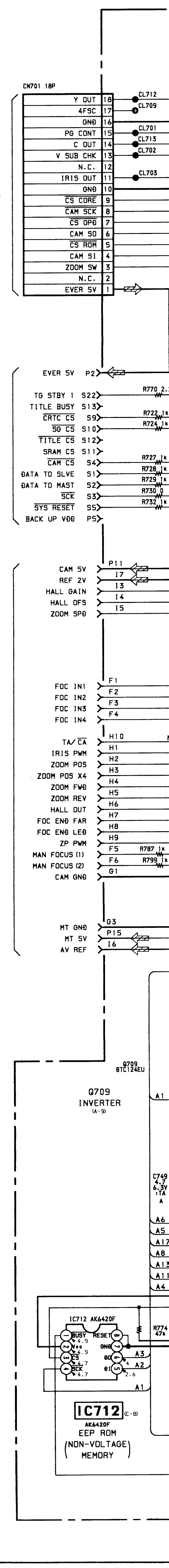
CS-31 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 87 for Printed Wiring

— Ref. No. CS-31 BOARD: 1000 series —

CS-31 BOARD (2/5)

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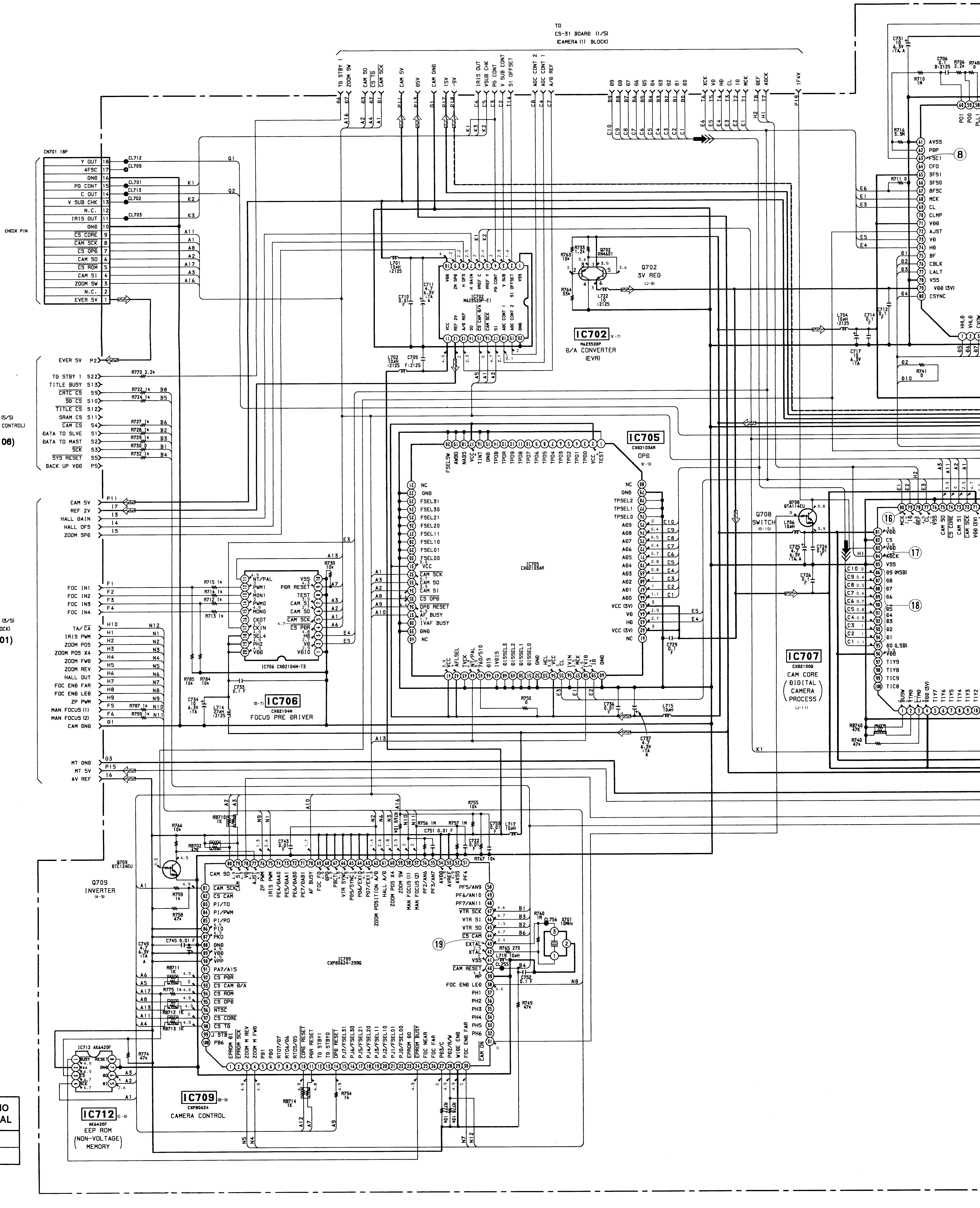
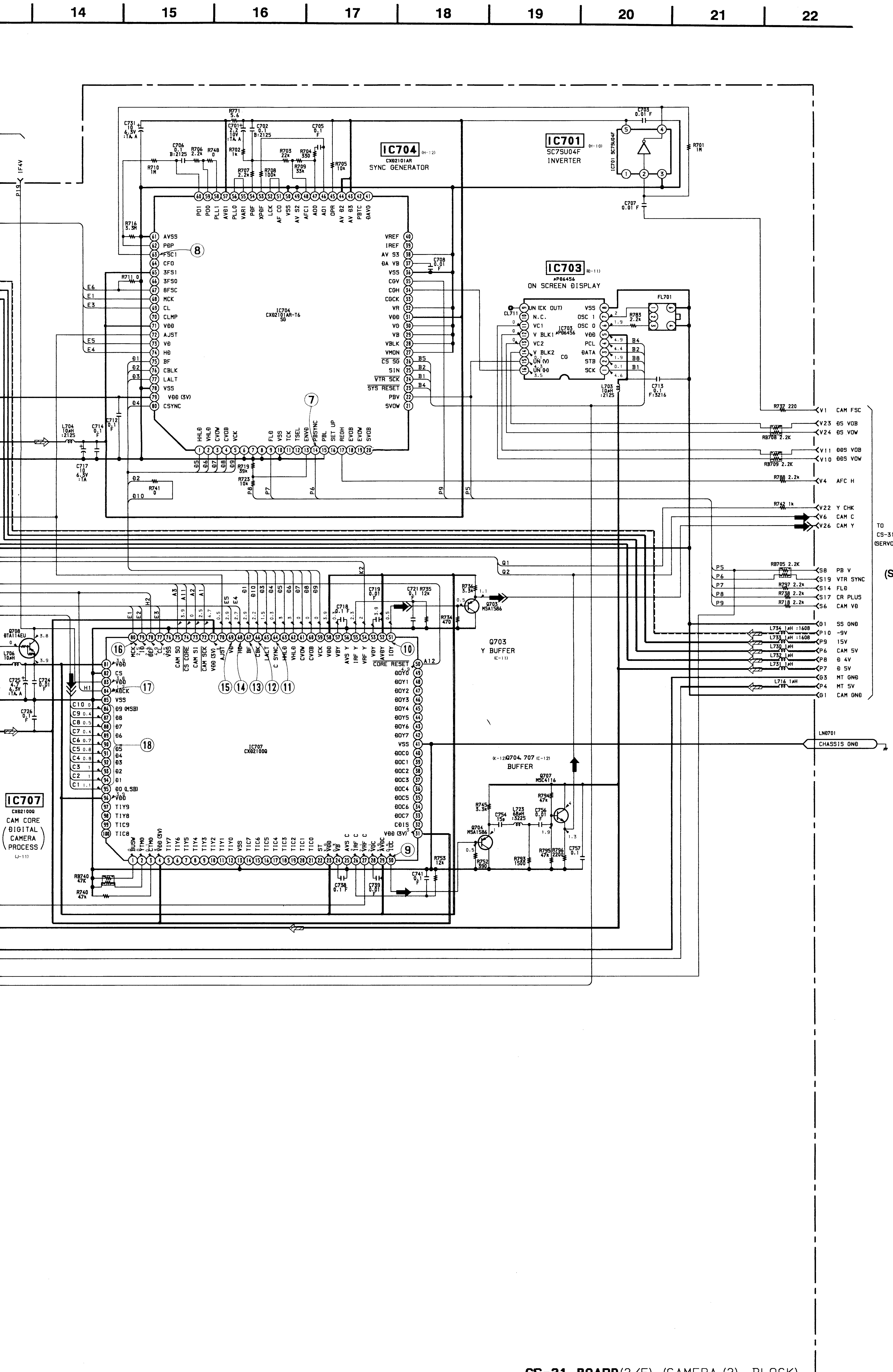
M
N
O
CN701 18P
Y OUT 18
4FSC 17
GND 16
PG CONT 15
C OUT 14
V SUB CHK 13
N.C. 12
IRIS OUT 11
GND 10
CS CORE 9
CAM SCK 8
CS OPD 7
CAM SO 6
CS ROM 5
CAM SI 4
ZOOM SW 3
N.C. 2
EVER 5V 1
CL712
CL709
CL701
CL713
CL702
CL703
CHECK PIN
EVER 5V P2
TG STBY 1 S22
TITLE BUSY S13
CRTC CS S9
SG CS S10
TITLE CS S12
SRAM CS S11
CAM CS S4
DATA TO SLVE S1
DATA TO MAST S2
SCK S3
SYS RESET S5
BACK UP VDD P5
R770 2.2
R722 1k
R724 1k
R727 1k
R728 1k
R729 1k
R730 0
R732 1k
TO
CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL)
(See Page 106)
CAM 5V P11
REF 2V I7
HALL GAIN I3
HALL OFS I4
ZOOM SPD I5
FOC IN1 F1
FOC IN2 F2
FOC IN3 F3
FOC IN4 F4
TA/CA H10
IRIS PWM H1
ZOOM POS H2
ZOOM POS X4 H3
ZOOM FWD H4
ZOOM REV H5
HALL OUT H6
FOC END FAR H7
FOC END LED H8
ZP PWM H9
MAN FOCUS (1) F5
MAN FOCUS (2) F6
CAM GND G1
R787 1k
R799 1k
MT GND G3
MT 5V P15
AV REF I6
TO
CS-31 BOARD (3/5)
(CAMERA (3) BLOCK)
(See Page 101)
Q709
BTC124EU
Q709
INVERTER
(A-9)
A1
C749
4.7
6.3V
:TA
A
A6
A5
A17
A8
A13
A11
A4
IC712 AK6420F
BUSY 1 4.9
Vcc 2 4.9
CS 3 4.7
SCK 4 4.7
RESET 8
GND 7
D0 6 4
D1 5 2.6
A3
A2
A1
R774
47k
IC712 (C-8)
AK6420F
EEP ROM
(NON-VOLTAGE MEMORY)

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	⇒	⇛	
PB				

(See Page 91, 92, 93, 94)


TO
CS-31 BOARD (1/5)
(CAMERA (1) BLOCK)
CN701 18P
CHECK PIN
IC702
M62352GP
D/A CONVERTER
(EVR)
Q702
XN4601
3V REG
IC705
CXD2103AR
OPD
Q708
DTA114EU
SWITCH
IC707
CXD2100Q
CAM CORE
(DIGITAL CAMERA PROCESS)
IC706
CX82104N
FOCUS PRE DRIVER
IC706 CX82104N-T3
Q709
DTC124EU
INVERTER
IC709
CXP80624
CAMERA CONTROL
IC709
CXP80624-299Q
IC712
AK6420F
EEP ROM
(NON-VOLTAGE MEMORY)
X701
10MHz
(8)
(16)
(17)
(18)
(19)
06)
01)


14
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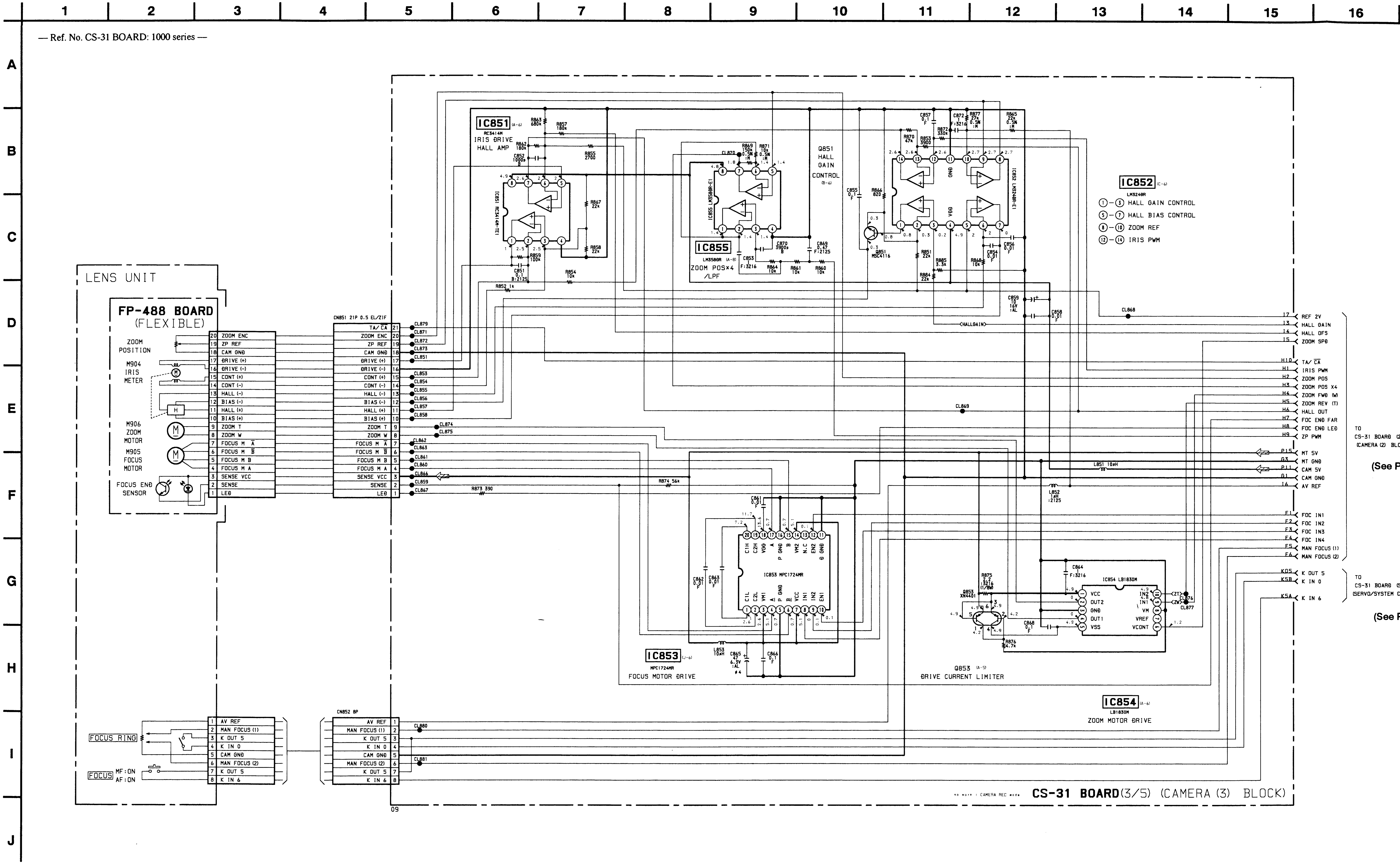
IC704 CX02101AR SYNC GENERATOR
IC701 SC7SU04F INVERTER
IC703 μPD6456 ON SCREEN DISPLAY
FL701
IC707 CX02100Q CAM CORE (DIGITAL CAMERA PROCESS)
Q703 Y BUFFER
Q704, 707 BUFFER
V1 CAM FSC
V23 OS VDB
V24 OS VDW
V11 ØØS VDB
V10 ØØS VDW
V4 AFC H
V22 Y CHK
V6 CAM C
V26 CAM Y
TO CS-31 BOARD (5/5) (SERVO/SYSTEM CONTROL)
S8 PB V
S19 VTR SYNC
S14 FLD
S17 CR PLUS
S6 CAM VD
G1 SS GND
P10 -9V
P9 15V
P6 CAM 5V
P8 Ø 4V
P7 Ø 5V
G3 MT GND
P4 MT 5V
G1 CAM GND
CHASSIS GND

(See Page 105, 106)

CS-31 BOARD(2/5) (CAMERA (2) BLOCK)

• Refer to page 87 for Printed Wiring Board.

— Ref. No. CS-31 BOARD: 1000 series —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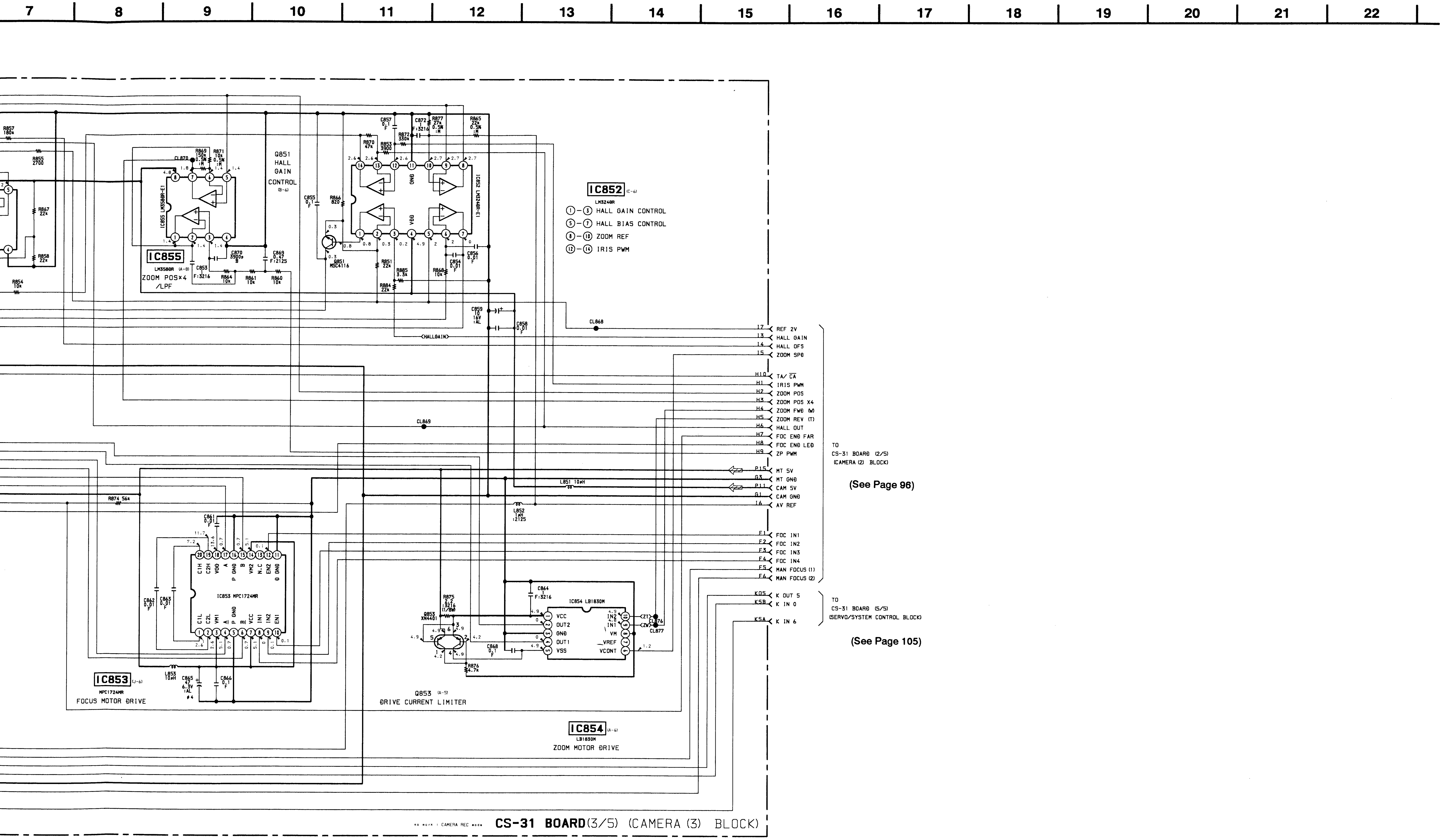
I
J
LENS UNIT
FP-488 BOARD
(FLEXIBLE)
ZOOM POSITION
M904 IRIS METER
M906 ZOOM MOTOR
M905 FOCUS MOTOR
FOCUS END SENSOR
20 ZOOM ENC
19 ZP REF
18 CAM GND
17 DRIVE (+)
16 DRIVE (-)
15 CONT (+)
14 CONT (-)
13 HALL (-)
12 BIAS (-)
11 HALL (+)
10 BIAS (+)
9 ZOOM T
8 ZOOM W
7 FOCUS M Ā
6 FOCUS M B̄
5 FOCUS M B
4 FOCUS M A
3 SENSE VCC
2 SENSE
1 LED
CN851 21P 0.5 EL/ZIF
TA/CA 21
CL879
CL871
CL872
CL873
CL851
CL853
CL854
CL855
CL856
CL857
CL858
CL874
CL875
CL862
CL863
CL861
CL860
CL866
CL859
CL867
IC851
RC3414M
IRIS DRIVE HALL AMP
IC851 RC3414M-TE1
IC855
LM3580R
ZOOM POS×4 /LPF
IC855 LM3580R-E1
Q851 HALL GAIN CONTROL
Q851 MSC4116
IC852
LM3240R
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
IC852 LM3240R-E1
CL868
CL869
<HALLGAIN>
L851 10μH
L852 1μH
R873 390
R874 56k
IC853 MPC1724MR
IC853
MPC1724MR
FOCUS MOTOR DRIVE
C1H C2H VGG A P GND B VM2 N.C EN2 B GND
C1L C2L VM1 Ā P GND B̄ VCC IN1 IN2 EN1
L853 10μH
Q853 XN4401
Q853
DRIVE CURRENT LIMITER
IC854 LB1830M
VCC OUT2 GND OUT1 VSS IN2 IN1 VM VREF VCONT
IC854
LB1830M
ZOOM MOTOR DRIVE
CL876
CL877
I7 REF 2V
I3 HALL GAIN
I4 HALL OFS
I5 ZOOM SPD
H10 TA/CA
H1 IRIS PWM
H2 ZOOM POS
H3 ZOOM POS X4
H4 ZOOM FWD (W)
H5 ZOOM REV (T)
H6 HALL OUT
H7 FOC END FAR
H8 FOC END LED
H9 ZP PWM
P15 MT 5V
G3 MT GND
P11 CAM 5V
G1 CAM GND
I6 AV REF
F1 FOC IN1
F2 FOC IN2
F3 FOC IN3
F4 FOC IN4
F5 MAN FOCUS (1)
F6 MAN FOCUS (2)
TO CS-31 BOARD (2 (CAMERA (2) BLO
(See P
K05 K OUT 5
K5B K IN 0
K5A K IN 6
TO CS-31 BOARD (5 (SERVO/SYSTEM C
(See P
FOCUS RING
FOCUS MF:ON AF:ON
1 AV REF
2 MAN FOCUS (1)
3 K OUT 5
4 K IN 0
5 CAM GND
6 MAN FOCUS (2)
7 K OUT 5
8 K IN 6
CN852 8P
CL880
CL881
CS-31 BOARD(3/5) (CAMERA (3) BLOCK)
09


7
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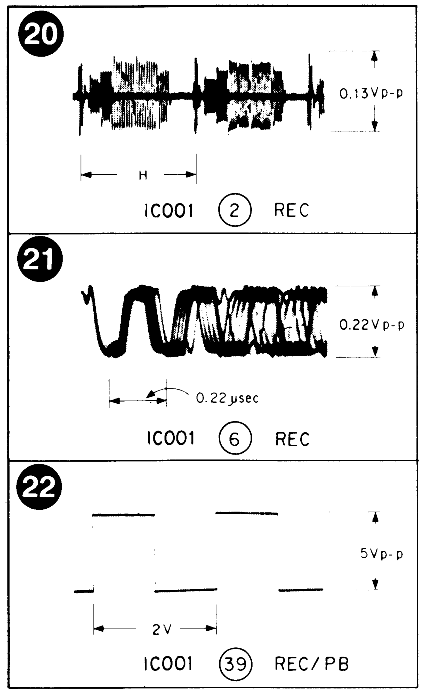
21
22
R857 180k
R855 2700
R867 22k
R858 22k
R854 10k
IC855 LM358OR-E1
R869 150k 0.5N
R871 10k 0.5N
CL870
C853 F:3216
R864 10k
R861 10k
R860 10k
C870 3900p
C869 0.47 F:2125
IC855
LM358OR (A-8)
ZOOM POS×4 /LPF
Q851 HALL GAIN CONTROL (B-6)
C855 0.1 F
R866 820
Q851 MSC4116
C857 0.1 F
C872 F:3216
R877 27k 0.5N
R872 330k
R870 47k
R853 3900
R865 22k 0.5N
GND
VDD
IC852 LM3240R-E1
R851 22k
R885 3.3k
R884 22k
R868 10k
C854 0.01 F
C856 0.01 F
C859 10 16V :AL
C858 0.01 F
<HALLGAIN>
CL868
IC852 (C-6)
LM3240R
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
I7 REF 2V
I3 HALL GAIN
I4 HALL OFS
I5 ZOOM SPD
H10 TA/ CA
H1 IRIS PWM
H2 ZOOM POS
H3 ZOOM POS X4
H4 ZOOM FWD (W)
H5 ZOOM REV (T)
H6 HALL OUT
H7 FOC END FAR
H8 FOC END LED
H9 ZP PWM
P15 MT 5V
G3 MT GND
P11 CAM 5V
G1 CAM GND
I6 AV REF
F1 FOC IN1
F2 FOC IN2
F3 FOC IN3
F4 FOC IN4
F5 MAN FOCUS (1)
F6 MAN FOCUS (2)
K05 K OUT 5
K5B K IN 0
K5A K IN 6
TO
CS-31 BOARD (2/5)
(CAMERA (2) BLOCK)
(See Page 96)
TO
CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)
(See Page 105)
CL869
L851 10μH
R874 56k
L852 1μH :2125
C861 0.01 F
C1H C2H VGG A P GND B VM2 N.C EN2 D GND
C1L C2L VM1 Ā P GND B̄ VCC IN1 IN2 EN1
IC853 MPC1724MR
C862 0.01 F
C863 0.01 F
L853 10μH
C865 47 6.3V :AL
C866 0.1 F
IC853 (J-6)
MPC1724MR
FOCUS MOTOR DRIVE
C864 1 F:3216
IC854 LB1830M
VCC OUT2 GND OUT1 VSS
IN2 IN1 VM VREF VCONT
R875 2.2 :3216 (1/8W)
Q853 XN4401
C868 0.1 F
R876 4.7k
CL876
CL877
Q853 (A-5)
DRIVE CURRENT LIMITER
IC854 (A-6)
LB1830M
ZOOM MOTOR DRIVE
CAMERA REC MODE
CS-31 BOARD(3/5) (CAMERA (3) BLOCK)

CS-31 BOARD (4/5)



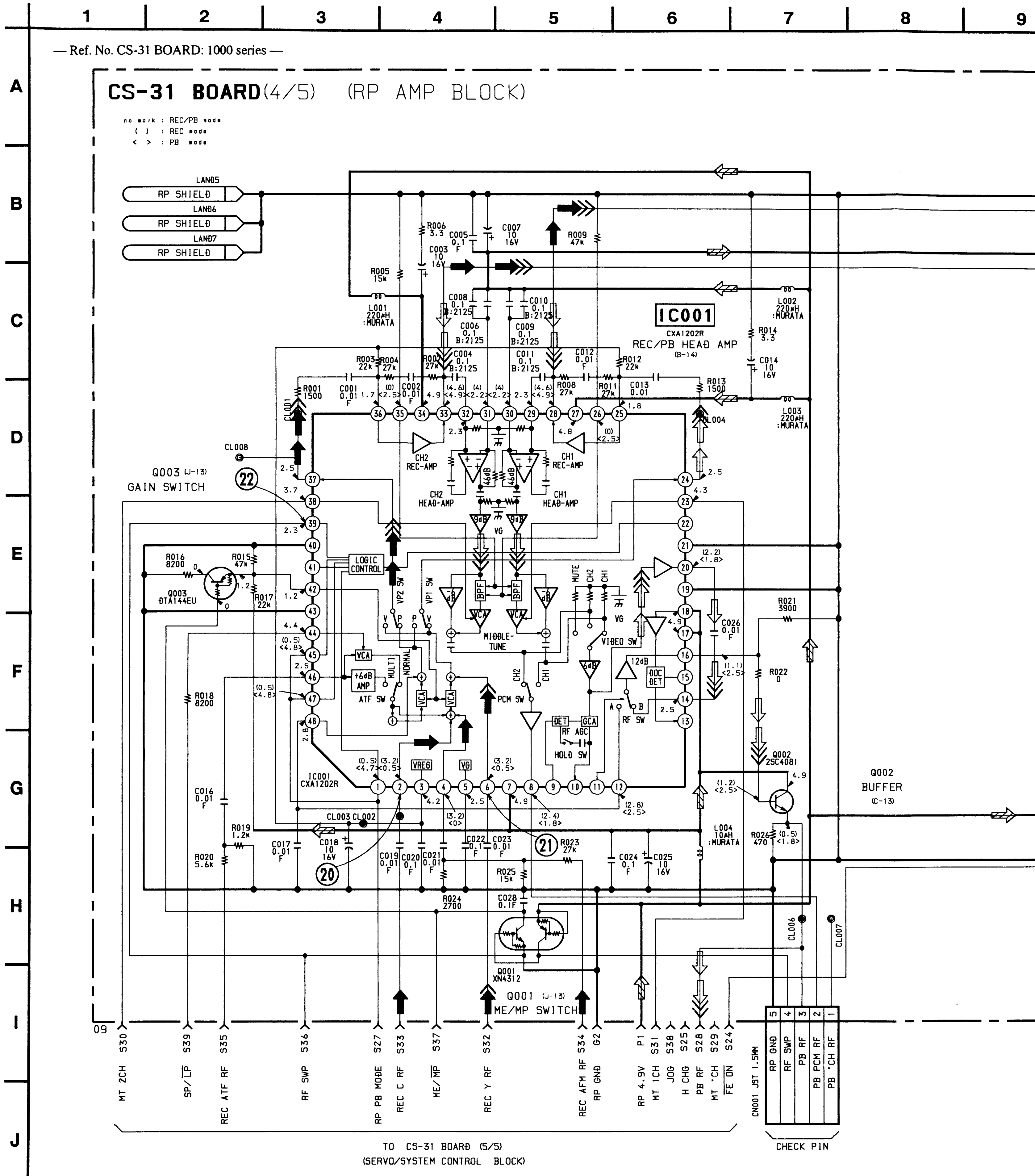
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨

CS-31 (REC/PB AMP) SCHEMATIC DIAGRAM

- Refer to page 87 for Printed Wiring Board.

— Ref. No. CS-31 BOARD: 1000 series —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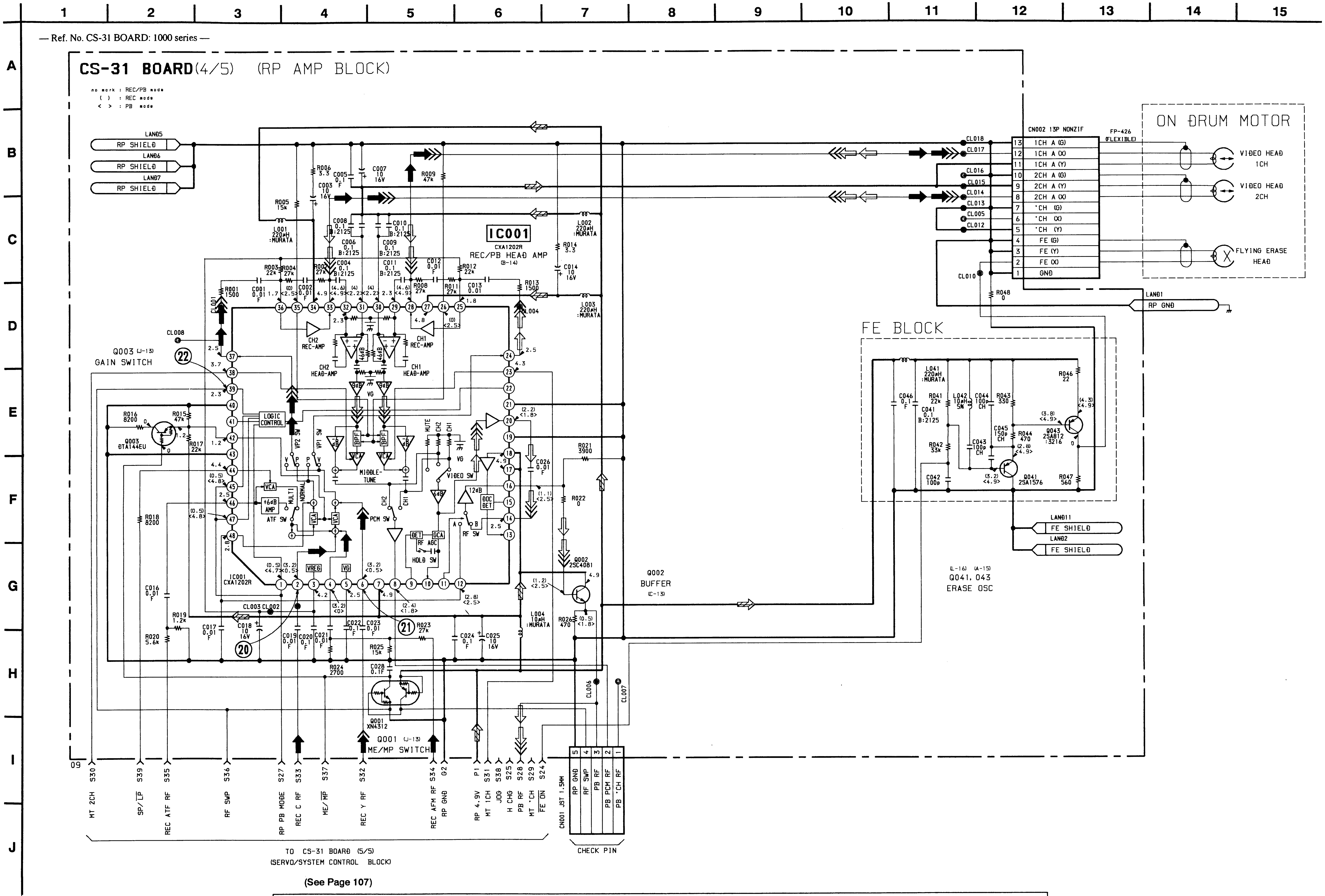
J
CS-31 BOARD(4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAN05
RP SHIELD
LAN06
RP SHIELD
LAN07
RP SHIELD
IC001
CXA1202R
REC/PB HEAD AMP
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
MIDDLE-TUNE
VIDEO SW
PCM SW
ATF SW
RF SW
RF AGC
HOLD SW
DOC DET
Q003 GAIN SWITCH
Q003 DTA144EU
Q002 BUFFER
Q002 2SC4081
Q001 XN4312
Q001 ME/MP SWITCH
L001 220μH :MURATA
L002 220μH :MURATA
L003 220μH :MURATA
L004 10μH :MURATA
CL001
CL002
CL003
CL004
CL006
CL007
CL008
09
S30 MT 2CH
S39 SP/LP
S35 REC ATF RF
S36 RF SWP
S27 RP PB MODE
S33 REC C RF
S37 ME/MP
S32 REC Y RF
S34 REC AFM RF
G2 RP GND
P1 RP 4.9V
S31 MT 1CH
S38 JOG
S25 H CHG
S28 PB RF
S29 MT 'CH
S24 FE ON
CN001 JST 1.5MM
5 RP GND
4 RF SWP
3 PB RF
2 PB PCM RF
1 PB 'CH RF
CHECK PIN
TO CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

(See Page 107)

CS-31 (REC/PB AMP) SCHEMATIC DIAGRAM

• Refer to page 87 for Printed Wiring Board.

— Ref. No. CS-31 BOARD: 1000 series —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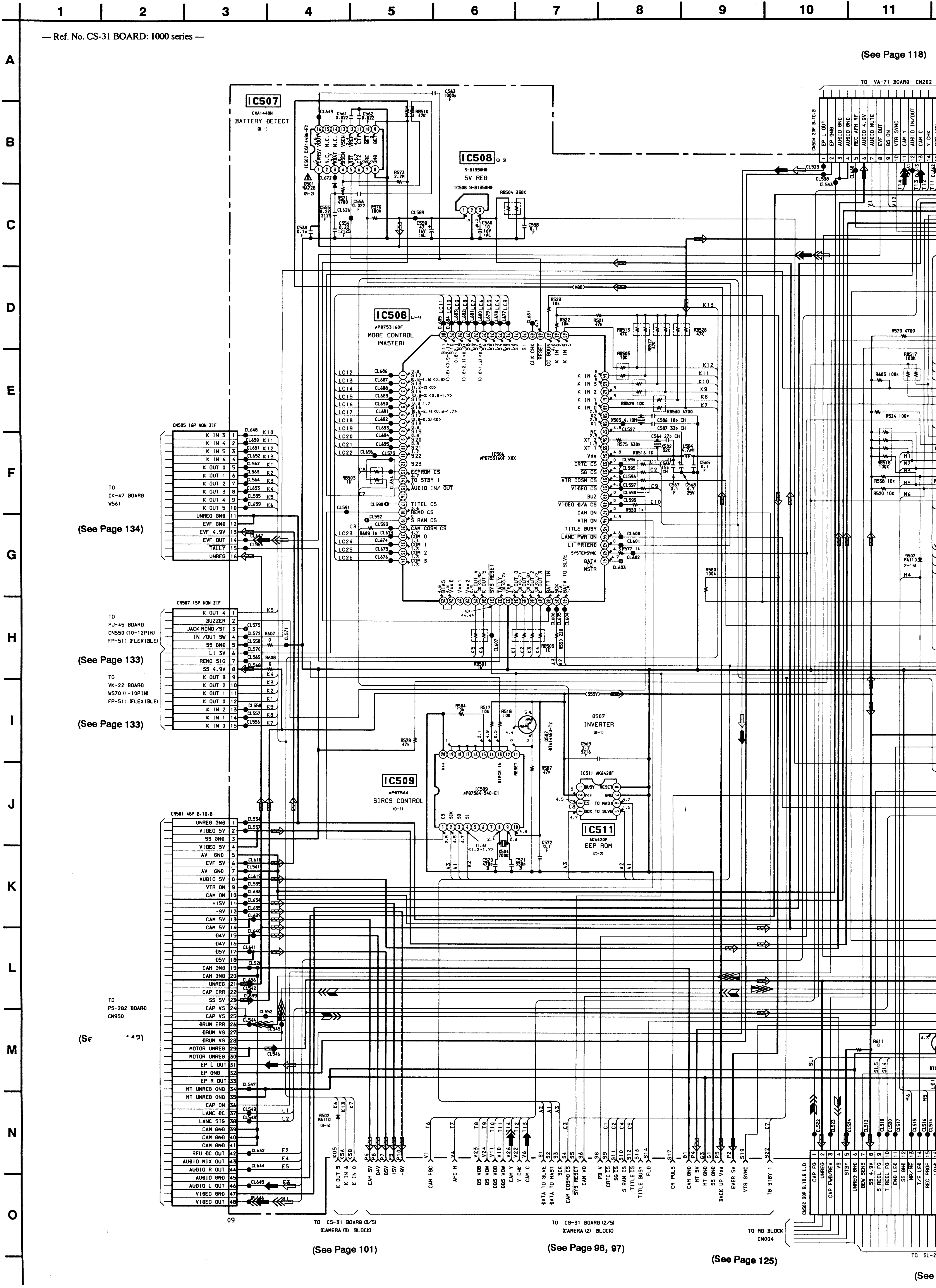
CS-31 BOARD(4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAND5
RP SHIELD
LAND6
RP SHIELD
LAND7
RP SHIELD
IC001
CXA1202R
REC/PB HEAD AMP
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
MIDDLE-TUNE
VIDEO SW
PCM SW
ATF SW
RF SW
RF AGC
HOLD SW
DOC DET
VREG
VG
Q003 (J-13) GAIN SWITCH
Q003 DTA144EU
Q001 (J-13) ME/MP SWITCH
Q001 XN4312
Q002 BUFFER (C-13)
Q002 2SC4081
L001 220μH :MURATA
L002 220μH :MURATA
L003 220μH :MURATA
L004 10μH :MURATA
CN002 13P NONZIF
FP-426 (FLEXIBLE)
1CH A (G)
1CH A (X)
1CH A (Y)
2CH A (G)
2CH A (Y)
2CH A (X)
'CH (G)
'CH (X)
'CH (Y)
FE (G)
FE (Y)
FE (X)
GND
ON DRUM MOTOR
VIDEO HEAD 1CH
VIDEO HEAD 2CH
FLYING ERASE HEAD
LAND1
RP GND
FE BLOCK
L041 220μH :MURATA
Q041 2SA1576
Q043 2SA812 :3216
(L-16) (A-15)
Q041, 043
ERASE OSC
LAND11
FE SHIELD
LAND2
FE SHIELD
CN001 JST 1.5MM
RP GND
RF SWP
PB RF
PB PCM RF
PB 'CH RF
CHECK PIN
MT 2CH
SP/LP
REC ATF RF
RF SWP
RP PB MODE
REC C RF
ME/MP
REC Y RF
REC AFM RF
RP GND
RP 4.9V
MT 1CH
JOG
H CHG
PB RF
MT 'CH
FE ON
TO CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

(See Page 107)

CS-31 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

- Refer to page 87 for Printed Wiring Board.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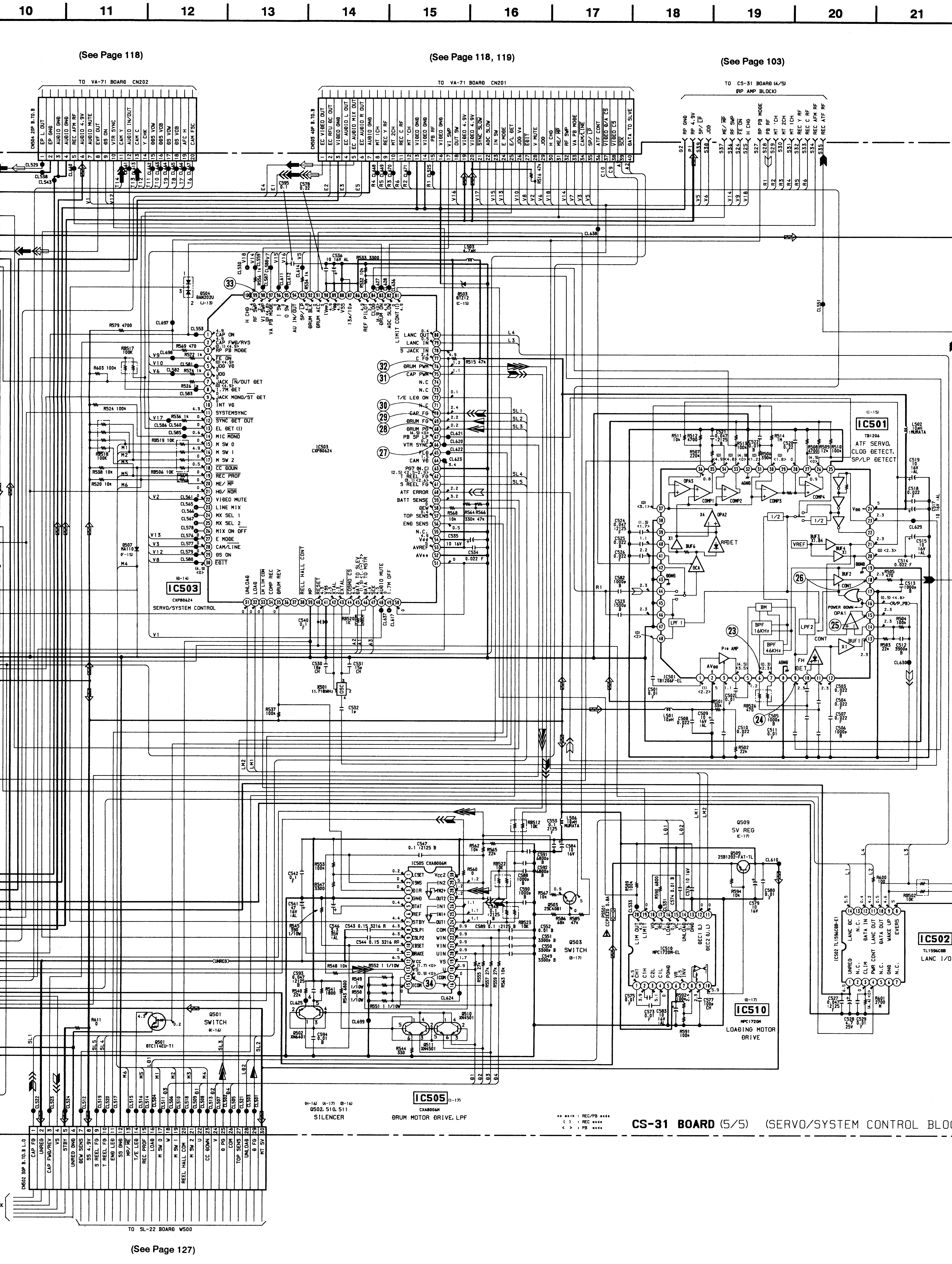
— Ref. No. CS-31 BOARD: 1000 series —
(See Page 118)
TO VA-71 BOARD CN202
IC507
CXA1448N
BATTERY DETECT
IC508
S-81350HG
5V REG
IC506
µPD75316GF
MODE CONTROL
(MASTER)
IC509
µPD7564
SIRCS CONTROL
IC511
AK6420F
EEP ROM
Q507
INVERTER
CN505 16P NON ZIF
TO
CK-47 BOARD
W561
(See Page 134)
CN507 15P NON ZIF
TO
PJ-45 BOARD
CN550 (10-12PIN)
FP-511 (FLEXIBLE)
(See Page 133)
TO
VK-22 BOARD
W570 (1-10PIN)
FP-511 (FLEXIBLE)
(See Page 133)
CN501 48P B.TO.B
TO
PS-282 BOARD
CN950
CN504 20P B.TO.B
CN502 30P B.TO.B L.D
TO CS-31 BOARD (3/5)
(CAMERA (3) BLOCK)
(See Page 101)
TO CS-31 BOARD (2/5)
(CAMERA (2) BLOCK)
(See Page 96, 97)
TO MD BLOCK
CN004
(See Page 125)
TO SL-2
(See

(See Page 118)

(See Page 118, 119)

(See Page 103)


10
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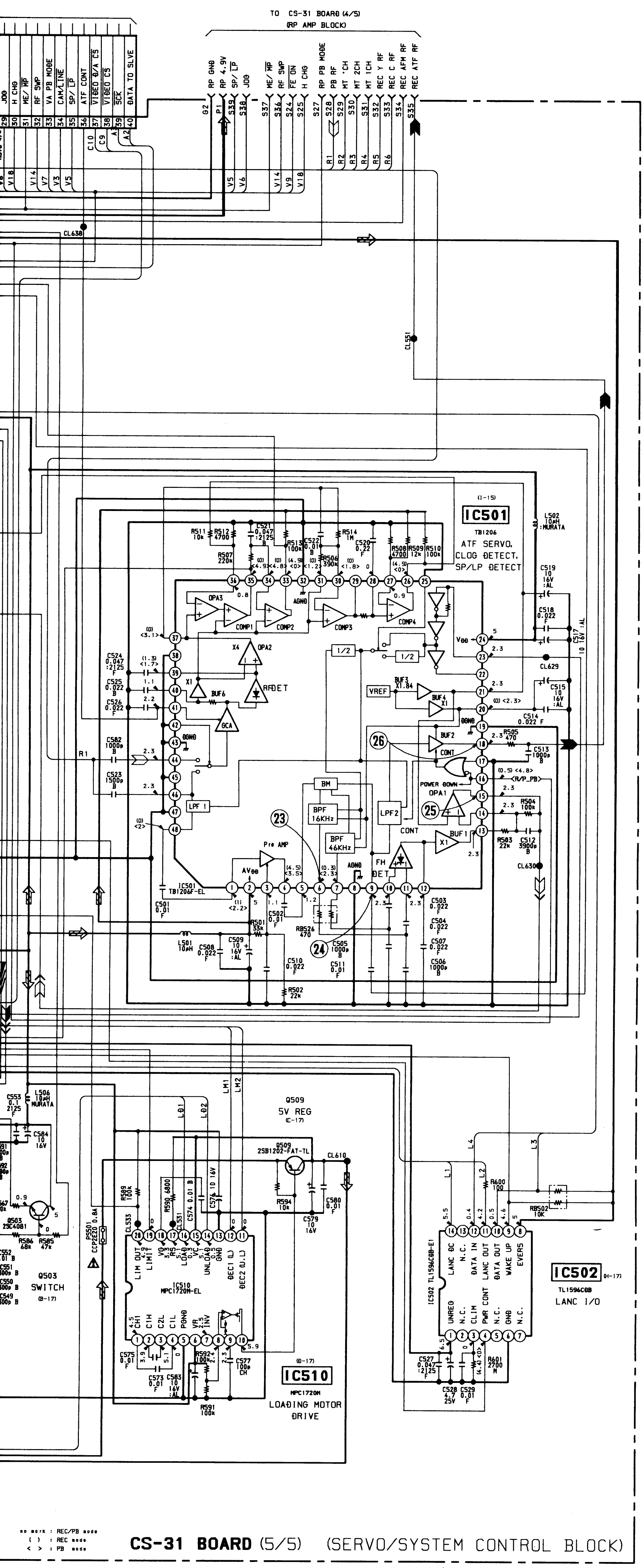
21
TO VA-71 BOARD CN202
TO VA-71 BOARD CN201
TO CS-31 BOARD (4/5) (RP AMP BLOCK)
IC503
CXP80624
SERVO/SYSTEM CONTROL
IC501
TB1206
ATF SERVO, CLOG DETECT, SP/LP DETECT
IC505
CXA8006M
DRUM MOTOR DRIVE, LPF
IC510
MPC1720M
LOADING MOTOR DRIVE
IC502
TL1596CGB
LANC I/O
Q501
SWITCH
Q503
SWITCH
Q509
5V REG
Q502, 510, 511
SILENCER
X501 11.718MHz
TO SL-22 BOARD W500
** mark : REC/PB mode
( ) : REC mode
< > : PB mode

CS-31 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOC

(See Page 127)

(See Page 103)


TO CS-31 BOARD (4/5) (RP AMP BLOCK)
RP GND
RP 4.9V
SP/LP
JOG
ME/MP
RF SWP
FE ON
H CHG
RP PB MODE
PB RF
MT CH
MT 2CH
MT 1CH
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
JOG
H CHG
ME/MP
RF SWP
VA PB MODE
CAM/LINE
SP/LP
ATF CONT
VIDEO 8/A CS
VIDEO CS
SCK
DATA TO SLVE
CL638
CL551
IC501
TB1206
ATF SERVO, CLOG DETECT, SP/LP DETECT
L502 10μH MURATA
OPA3
COMP1
COMP2
COMP3
COMP4
OPA2
RFDET
BUF6
GCA
VREF
BUF3
BUF4
BUF2
CONT
POWER DOWN
OPA1
BPF 16KHz
BPF 46KHz
LPF1
LPF2
BUF1
Pre AMP
AVcc
FH DET
IC501 TB1206F-EL
CL629
CL630
R502 22k
Q509 5V REG
Q509 2SB1202-FAT-TL
CL610
LM1
LM2
L01
L02
IC510 MPC1720M-EL
LIM OUT
LIMIT
UNLOAD
BEC1 (L)
BEC2 (L)
CH1
C1H
C2L
C1L
PGND
INV
IC510
MPC1720M
LOADING MOTOR DRIVE
IC502 TL1596C0B-E1
LANC DC
N.C.
DATA IN
LANC OUT
DATA OUT
WAKE UP
EVERS
UNREG
CLIM
PWR CONT
GND
IC502
TL1596C0B
LANC I/O
Q503 2SC4081
Q503 SWITCH
L506 10μH MURATA
PS501 0.8A
CL533
R600 100
RB502 10K
R601 2700
** mark : REC/PB mode
( ) : REC mode
< > : PB mode

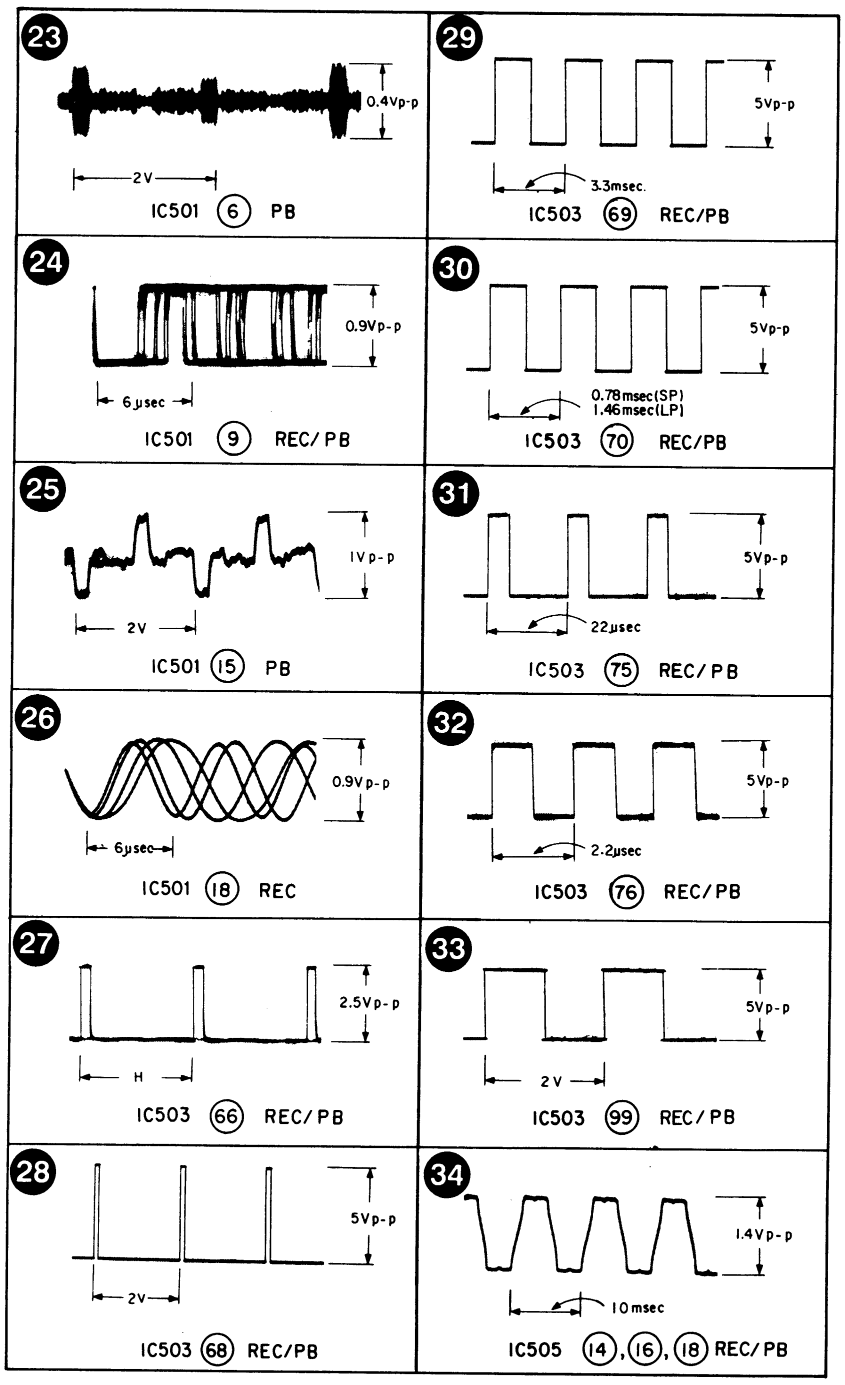
CS-31 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo	➤»	⊃»»	⊃»
Capstan servo (speed and phase)		⊃»	
Ref. signal	➤	⊃	⊃

CS-31 BOARD (5/5)



〈 DIODE 〉

D102	8-719-800-76	DIODE	1SS226
D201	8-719-941-86	DIODE	DAN202U
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-09	DIODE	DAP202U
D205	8-719-941-86	DIODE	DAN202U
D206	8-719-941-86	DIODE	DAN202U
D301	8-719-940-45	DIODE	DWA010
D361	8-719-941-86	DIODE	DAN202U
D362	8-719-941-86	DIODE	DAN202U
D401	8-719-105-32	DIODE	RD2. 7M-B2

〈 IC 〉

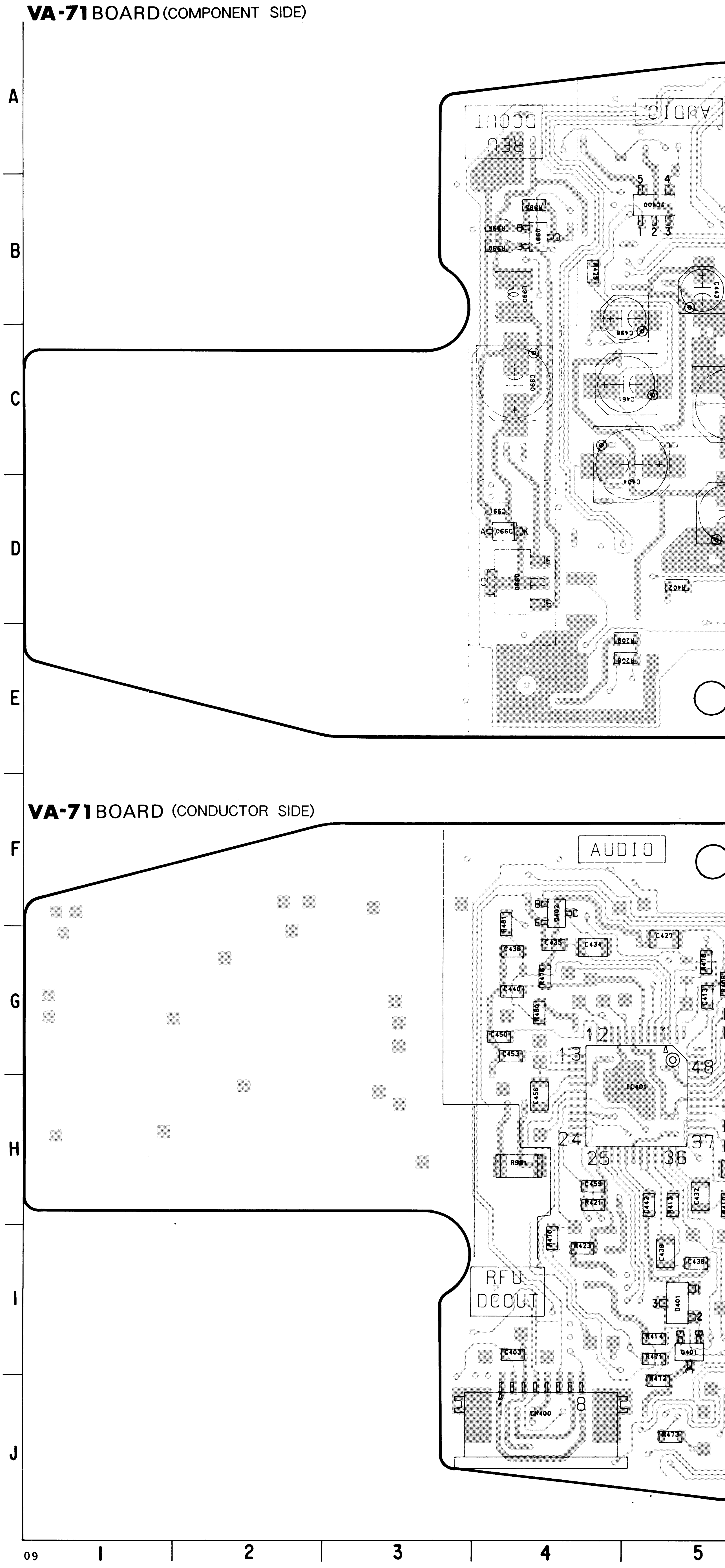
IC051	8-752-333-24	IC	CXL1506M
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-036-19	IC	CXA1207AR
IC202	8-759-710-29	IC	NJM2235M
IC203	8-759-055-82	IC	M62353GP
IC204	8-759-055-82	IC	M62353GP
IC205	8-759-636-33	IC	CXA1452
IC206	8-752-053-21	IC	CXA1211M
IC301	8-752-036-20	IC	CXA1208R
IC361	8-759-605-61	IC	CXA1203N
IC400	8-759-234-77	IC	TC4S66F
IC401	8-759-824-22	IC	CXA1535R

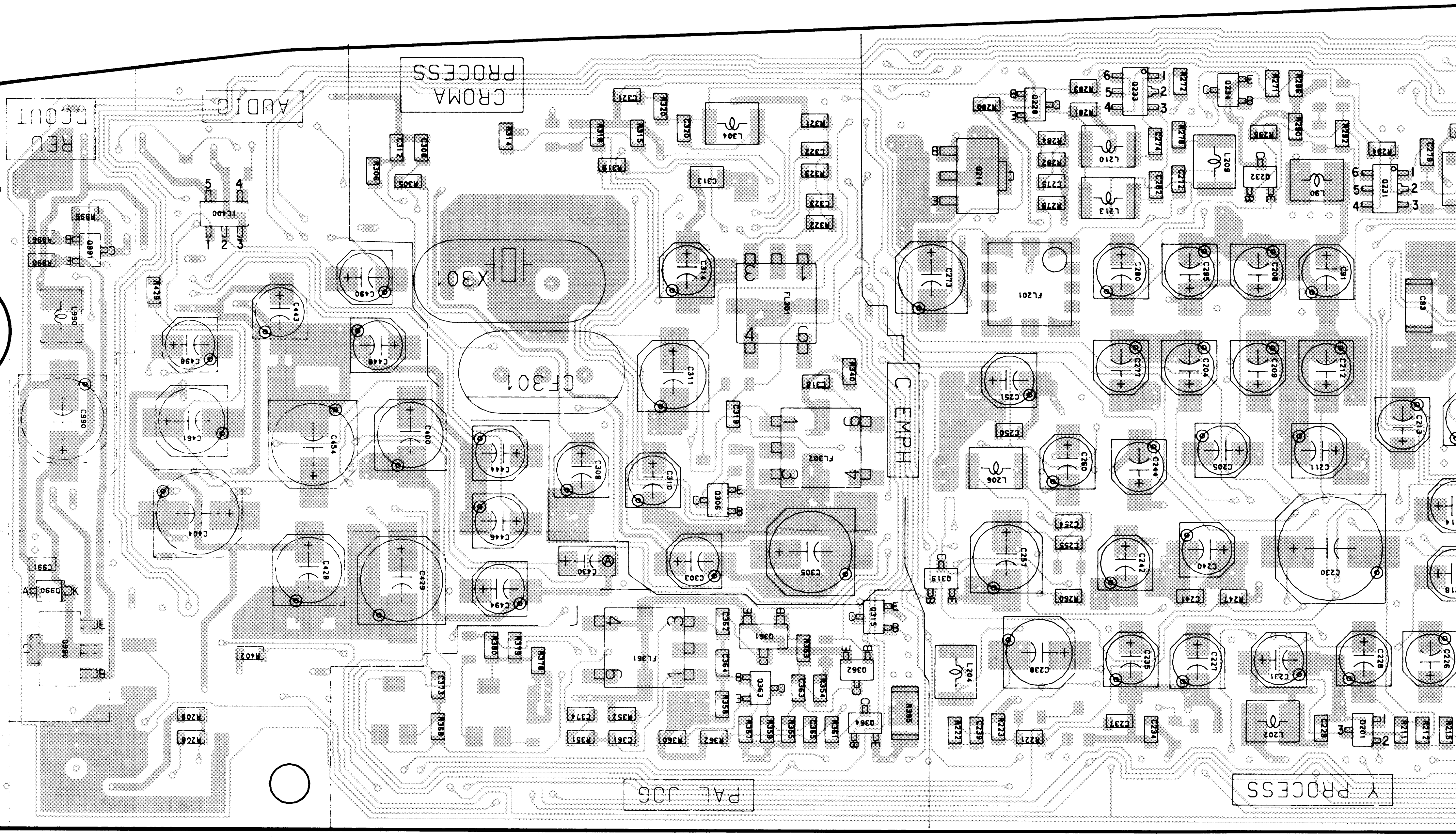
〈 TRANSISTOR 〉

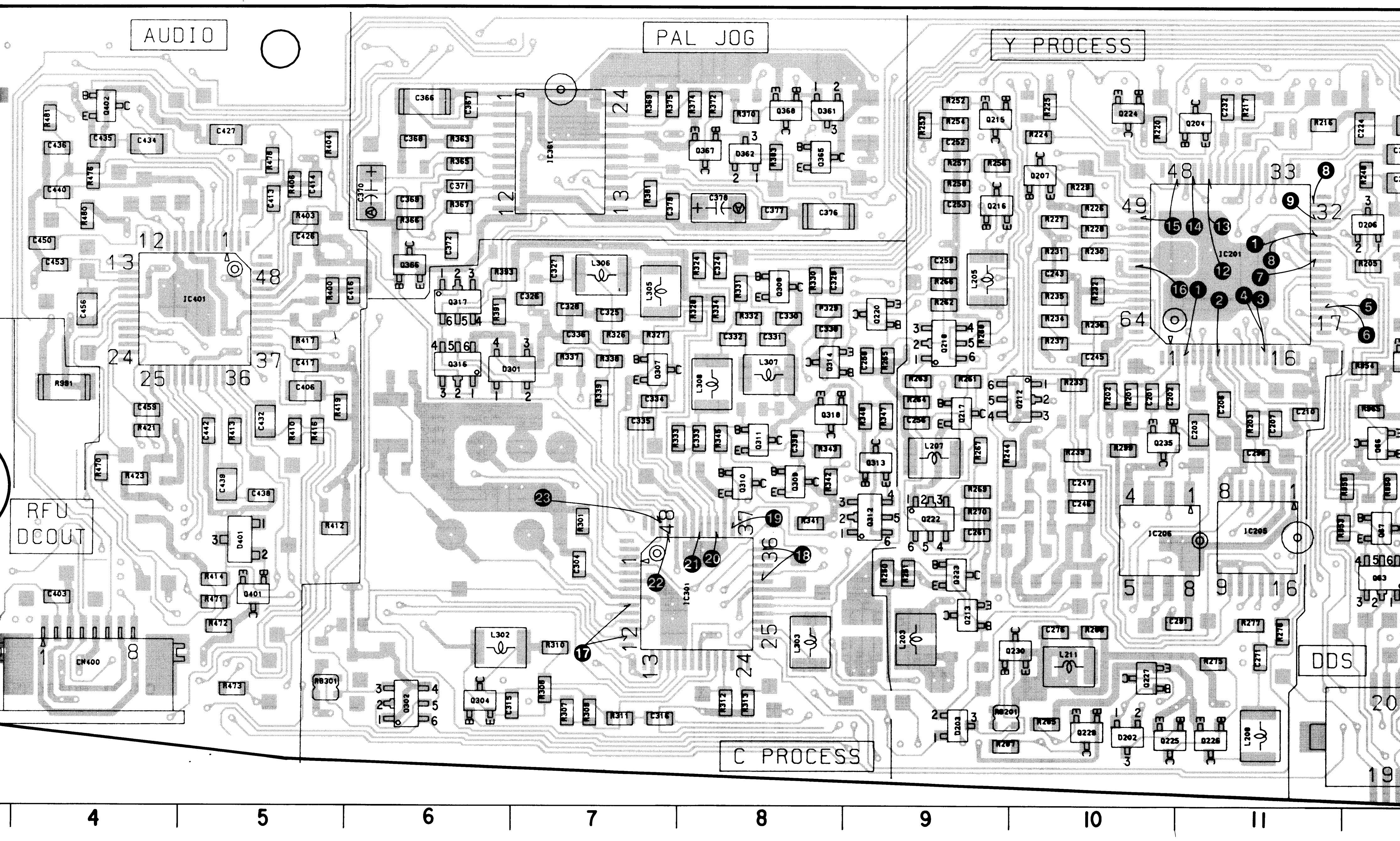
Q051	8-729-920-48	TRANSISTOR	IMH2
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345
Q053	8-729-905-23	TRANSISTOR	2SA1576-R
Q054	8-729-905-23	TRANSISTOR	2SA1576-R
Q055	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q056	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q057	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q060	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q061	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q063	8-729-422-54	TRANSISTOR	XN4215
Q064	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q065	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q066	8-729-905-23	TRANSISTOR	2SA1576-R
Q067	8-729-905-96	TRANSISTOR	DTA114TU
Q103	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q104	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q110	8-729-920-XX	TRANSISTOR	DTA114EU
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13
Q114	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q118	8-729-920-48	TRANSISTOR	IMH2
Q119	8-729-905-23	TRANSISTOR	2SA1576-R
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13
Q121	8-729-905-23	TRANSISTOR	2SA1576-R
Q122	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q202	8-729-905-23	TRANSISTOR	2SA1576-R
Q204	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q207	8-729-905-12	TRANSISTOR	DTA144EU
Q212	8-729-920-48	TRANSISTOR	IMH2
Q213	8-729-905-18	TRANSISTOR	DTC144EU
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q215	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q216	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q217	8-729-905-12	TRANSISTOR	DTA144EU
Q218	8-729-402-81	TRANSISTOR	XN4501
Q220	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q222	8-729-402-81	TRANSISTOR	XN4501
Q223	8-729-905-12	TRANSISTOR	DTA144EU
Q224	8-729-905-18	TRANSISTOR	DTC144EU
Q225	8-729-905-18	TRANSISTOR	DTC144EU
Q226	8-729-823-16	TRANSISTOR	2SC4555-5. 6. 7
Q227	8-729-905-18	TRANSISTOR	DTC144EU
Q228	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q229	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q230	8-729-905-23	TRANSISTOR	2SA1576-R
Q231	8-729-925-42	TRANSISTOR	IMT2
Q232	8-729-905-23	TRANSISTOR	2SA1576-R
Q233	8-729-925-42	TRANSISTOR	IMT2
Q234	8-729-905-18	TRANSISTOR	DTC144EU
Q235	8-729-905-23	TRANSISTOR	2SA1576-R
Q302	8-729-402-81	TRANSISTOR	XN4501
Q304	8-729-905-12	TRANSISTOR	DTA144EU
Q306	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q307	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q308	8-729-905-23	TRANSISTOR	2SA1576-R
Q309	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q310	8-729-905-18	TRANSISTOR	DTC144EU
Q311	8-729-905-23	TRANSISTOR	2SA1576-R
Q312	8-729-420-20	TRANSISTOR	XN4312
Q313	8-729-905-12	TRANSISTOR	DTA144EU
Q314	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q315	8-729-905-12	TRANSISTOR	DTA144EU
Q316	8-729-920-48	TRANSISTOR	IMH2
Q317	8-729-420-20	TRANSISTOR	XN4312
Q318	8-729-905-18	TRANSISTOR	DTC144EU
Q319	8-729-905-18	TRANSISTOR	DTC144EU
Q361	8-729-102-07	TRANSISTOR	2SC2223-F13
Q362	8-729-905-18	TRANSISTOR	DTC144EU
Q363	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q364	8-729-905-12	TRANSISTOR	DTA144EU
Q365	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q366	8-729-905-18	TRANSISTOR	DTC144EU
Q367	8-729-905-18	TRANSISTOR	DTC144EU
Q368	8-729-905-12	TRANSISTOR	DTA144EU
Q401	8-729-921-08	TRANSISTOR	DTC144TU
Q402	8-729-905-18	TRANSISTOR	DTC144EU
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q991	8-729-120-28	TRANSISTOR	2SC1623-L5L6

VA-71 (VIDEO, AUDIO) PRINTED WIRING BOARD

— Ref. No. VA-71 BOARD: 2000 series —




REC DCOUT
AUDIO
CROMA PROCESS
X301
CF301
FL301
FL302
FL361
FL201
C EMPH
PAL JOG
Y PROCESS


AUDIO
PAL JOG
Y PROCESS
IC401
IC361
IC301
IC201
IC205
IC206
RFU DCOUT
CN400
C PROCESS
DDS
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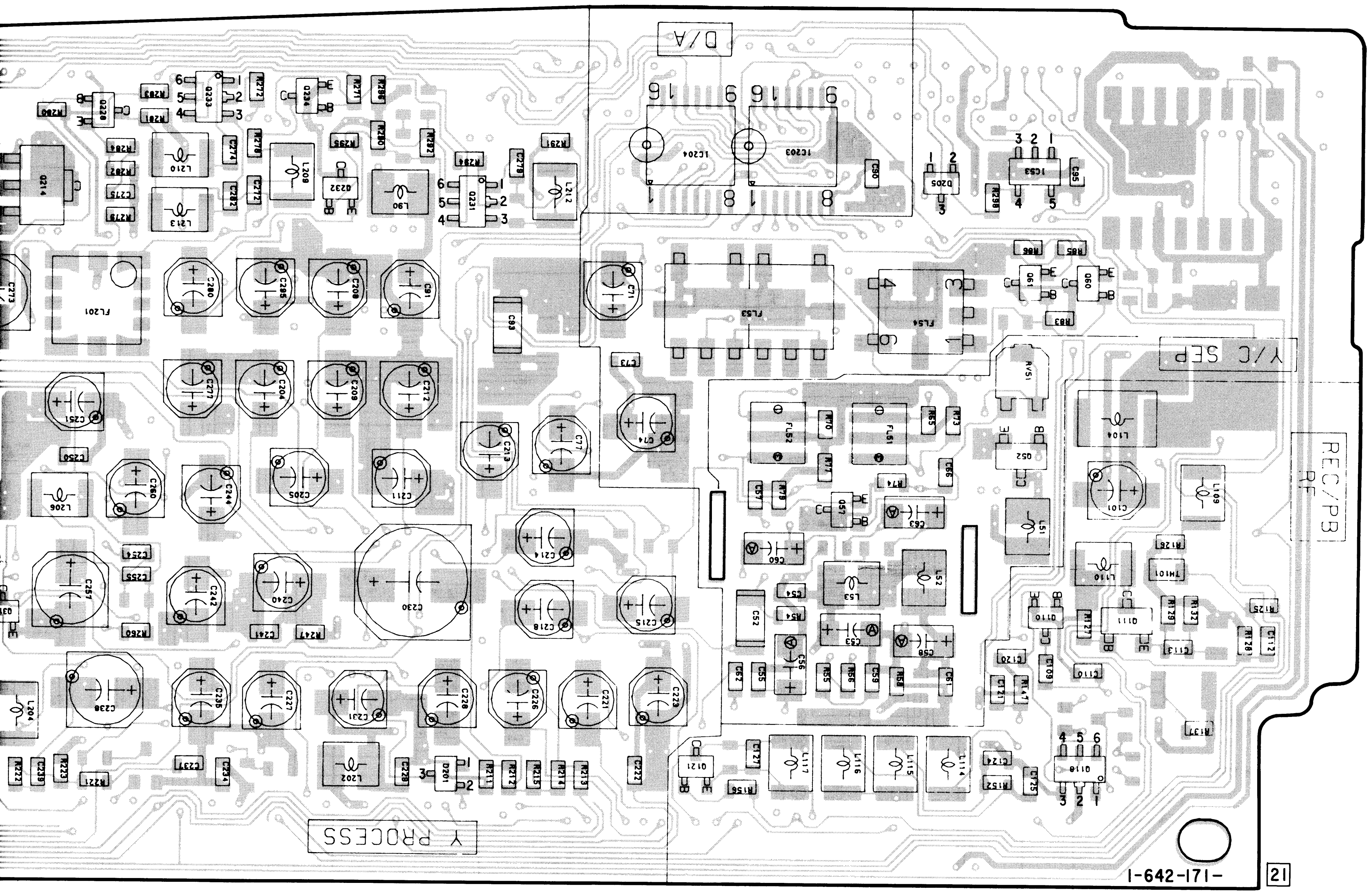
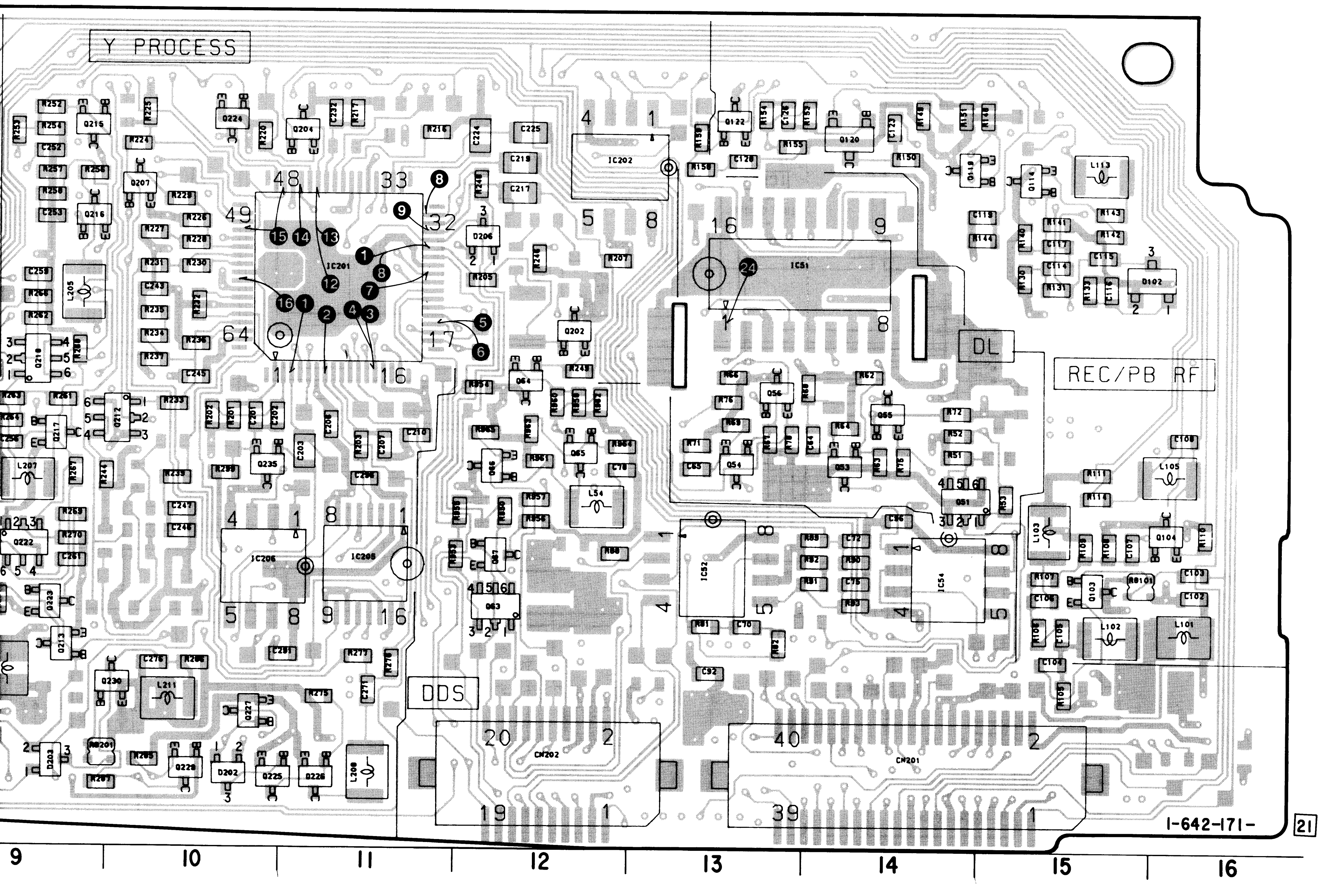
11


D/A
Y/C SEP
REC/PB RF
Y PROCESS
FL201
FL53
FL54
IC204
IC203
IC53
1-642-171-
21

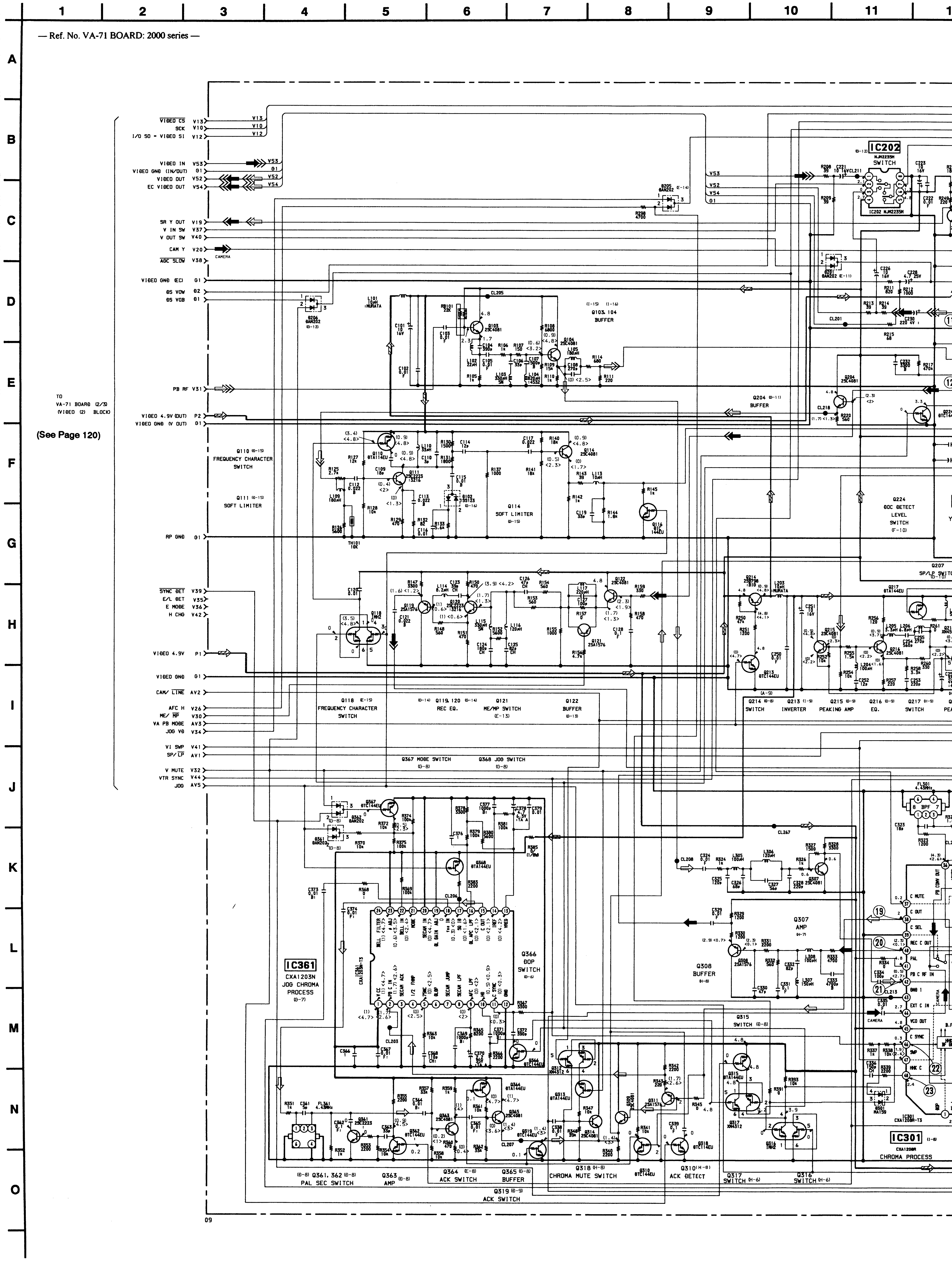

Y PROCESS
IC201
IC202
IC51
IC52
IC54
IC205
IC206
CN202
CN201
DDS
DL
REC/PB RF
1-642-171-
21
9
10
11
12
13
14
15
16

VA-71 (VIDEO) SCHEMATIC DIAGRAM

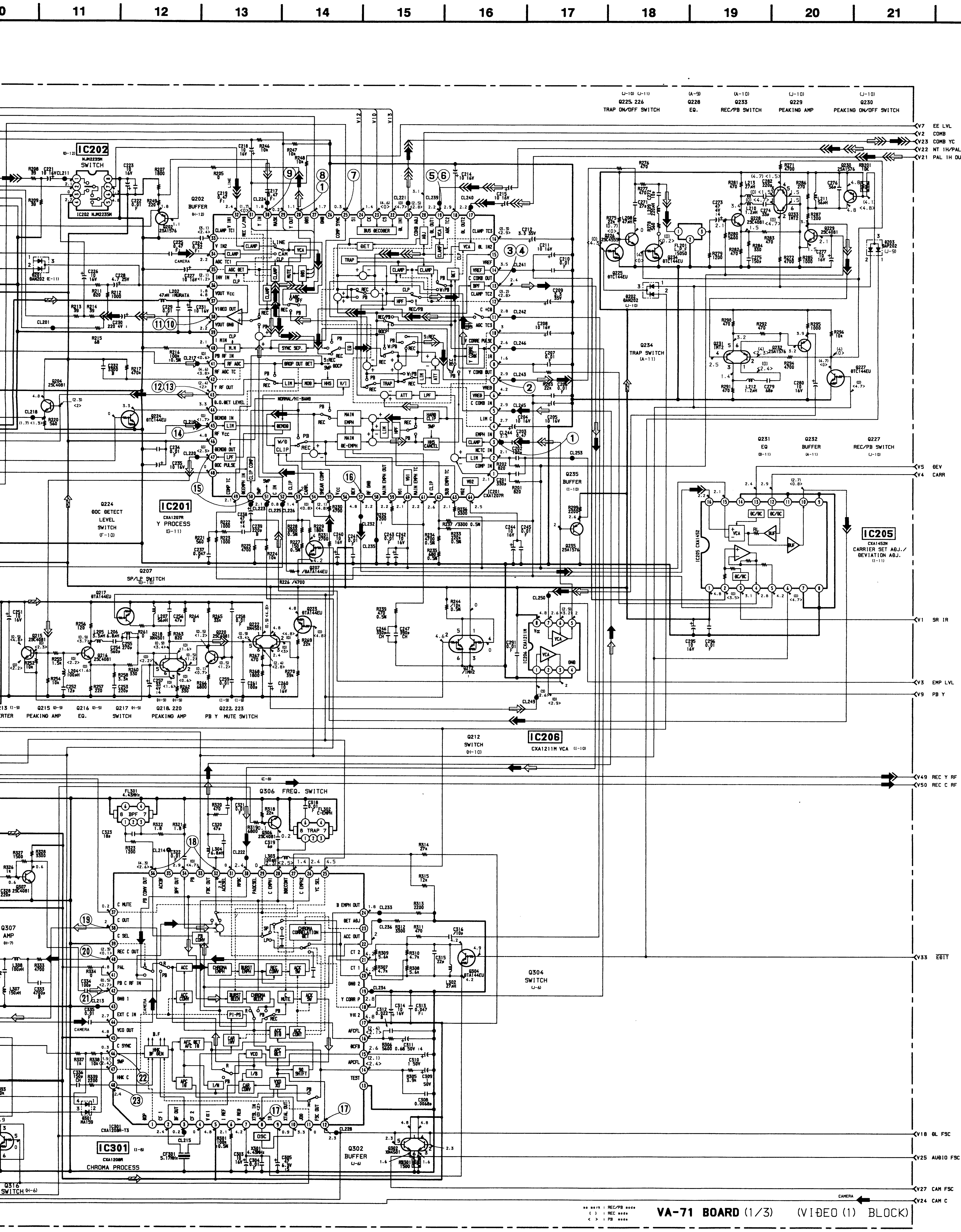
• Refer to page 87 for Printed Wiring Board.

— Ref. No. VA-71 BOARD: 2000 series —

(See Page 120)



TO VA-71 BOARD (2/3) (VIDEO (2) BLOCK)
VIDEO CS V13
SCK V10
I/O SO - VIDEO SI V12
VIDEO IN V53
VIDEO GND (IN/OUT) G1
VIDEO OUT V52
EC VIDEO OUT V54
SR Y OUT V19
V IN SW V37
V OUT SW V40
CAM Y V20
AGC SLOW V38
VIDEO GND (EC) G1
8S VDW 82
8S VDB 81
PB RF V31
VIDEO 4.9V (OUT) P2
VIDEO GND (V OUT) G1
RP GND G1
SYNC DET V39
E/L DET V35
E MODE V36
H CHG V42
VIDEO 4.9V P1
VIDEO GND G1
CAM/ LINE AV2
AFC H V26
ME/ MP V30
VA PB MODE AV3
JOG V0 V34
VI SWP V41
SP/LP AV1
V MUTE V32
VTR SYNC V44
JOG AV5
IC202 NJM2235M SWITCH
Q103, 104 BUFFER
Q110 FREQUENCY CHARACTER SWITCH
Q111 SOFT LIMITER
Q114 SOFT LIMITER
Q204 BUFFER
Q224 ODC DETECT LEVEL SWITCH
Q207 SP/LP SWITCH
Q118 FREQUENCY CHARACTER SWITCH
Q119, 120 REC EQ.
Q121 ME/MP SWITCH
Q122 BUFFER
Q214 SWITCH
Q213 INVERTER
Q215 PEAKING AMP
Q216 EQ.
Q217 SWITCH
Q367 MODE SWITCH
Q368 JOG SWITCH
IC361 CXA1203N JOG CHROMA PROCESS
Q366 DOP SWITCH
Q307 AMP
Q308 BUFFER
Q315 SWITCH
IC301 CXA1208R CHROMA PROCESS
Q361, 362 PAL SEC SWITCH
Q363 AMP
Q364 ACK SWITCH
Q365 BUFFER
Q319 ACK SWITCH
Q318 CHROMA MUTE SWITCH
Q310 ACK DETECT
Q317 SWITCH
Q316 SWITCH



11
12
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16
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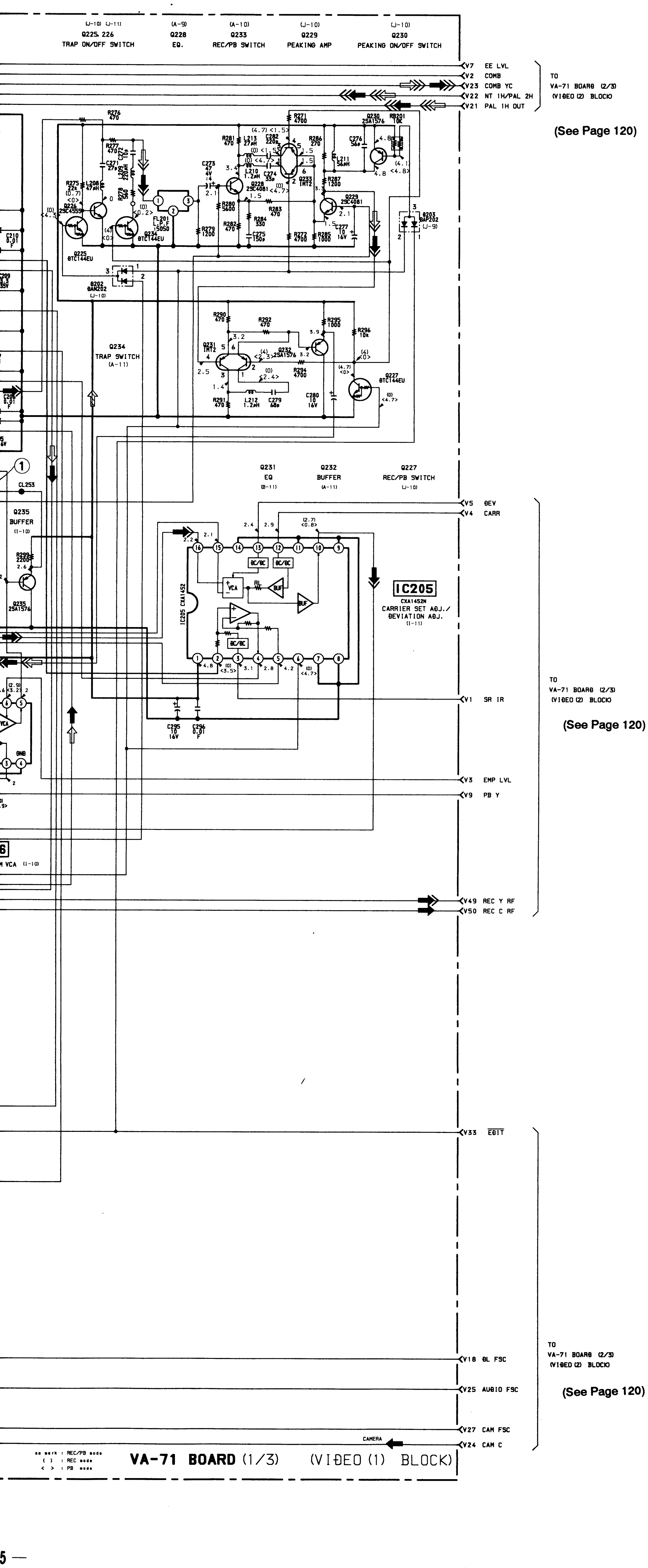
18
19
20
21
Q225, 226 TRAP ON/OFF SWITCH
Q228 EQ.
Q233 REC/PB SWITCH
Q229 PEAKING AMP
Q230 PEAKING ON/OFF SWITCH
V7 EE LVL
V2 COMB
V23 COMB YC
V22 NT 1H/PAL
V21 PAL 1H OU
IC202 NJM2235M SWITCH
Q202 BUFFER
Q234 TRAP SWITCH
Q231 EQ
Q232 BUFFER
Q227 REC/PB SWITCH
V5 BEV
V4 CARR
Q235 BUFFER
IC205 CXA1452M CARRIER SET ADJ./ DEVIATION ADJ.
Q224 BOC DETECT LEVEL SWITCH
IC201 CXA1207R Y PROCESS
Q207 SP/LP SWITCH
V1 SR IR
IC206 CXA1211M VCA
V3 EMP LVL
V9 PB Y
Q215 PEAKING AMP
Q216 EQ.
Q217 SWITCH
Q218, 220 PEAKING AMP
Q222, 223 PB Y MUTE SWITCH
Q212 SWITCH
V49 REC Y RF
V50 REC C RF
Q306 FREQ. SWITCH
Q307 AMP
Q304 SWITCH
V33 EDIT
IC301 CXA1208R CHROMA PROCESS
Q302 BUFFER
Q316 SWITCH
V18 BL FSC
V25 AUDIO FSC
V27 CAM FSC
CAMERA
V24 CAM C
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VA-71 BOARD (1/3) (VIDEO (1) BLOCK)


(J-10) (J-11)
Q225, 226
TRAP ON/OFF SWITCH
(A-9)
Q228
EQ.
(A-10)
Q233
REC/PB SWITCH
(J-10)
Q229
PEAKING AMP
(J-10)
Q230
PEAKING ON/OFF SWITCH
V7 EE LVL
V2 COMB
V23 COMB YC
V22 NT 1H/PAL 2H
V21 PAL 1H OUT
TO
VA-71 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 120)
R276 470
R277 470
C271 27p
C272 10p
L209 220µH
R278 560
R275 22k
L208 47µH
Q226 2SC4555
Q225 DTC144EU
Q234 DTC144EU
C210 0.01 F
C209 3.3 35V
FL201 L.P.F :5050
C273 47 4V
R279 1200
R280 5600
R281 470
L213 27µH
C282 220p
L210 1.2µH
C274 33p
Q228 2SC4081
R282 470
R283 470
R284 330
C275 150p
R271 4700
R272 4700
R286 270
Q233 IMT2
R287 1200
L211 56µH
C276 56p
Q230 2SA1576
RB201 10K
Q229 2SC4081
R285 1000
C277 10 16V
D203 DAP202 (J-9)
D202 DAN202 (J-10)
Q234
TRAP SWITCH
(A-11)
R290 470
R292 470
R295 1000
R296 10k
Q231 IMT2
Q232 2SA1576
R294 4700
R291 470
L212 1.2µH
C279 68p
C280 10 16V
Q227 DTC144EU
C208 0.01 F
CL253
Q235
BUFFER
(I-10)
R299 2200
Q235 2SA1576
VCA
GND
M VCA (I-10)
Q231
EQ
(B-11)
Q232
BUFFER
(A-11)
Q227
REC/PB SWITCH
(J-10)
V5 DEV
V4 CARR
IC205
CXA1452N
CARRIER SET ADJ./
DEVIATION ADJ.
(I-11)
IC205 CXA1452
DC/DC
BUF
RL
C295 10 16V
C296 0.01 F
V1 SR IR
V3 EMP LVL
V9 PB Y
V49 REC Y RF
V50 REC C RF
V33 EDIT
V18 DL FSC
V25 AUDIO FSC
V27 CAM FSC
V24 CAM C
CAMERA

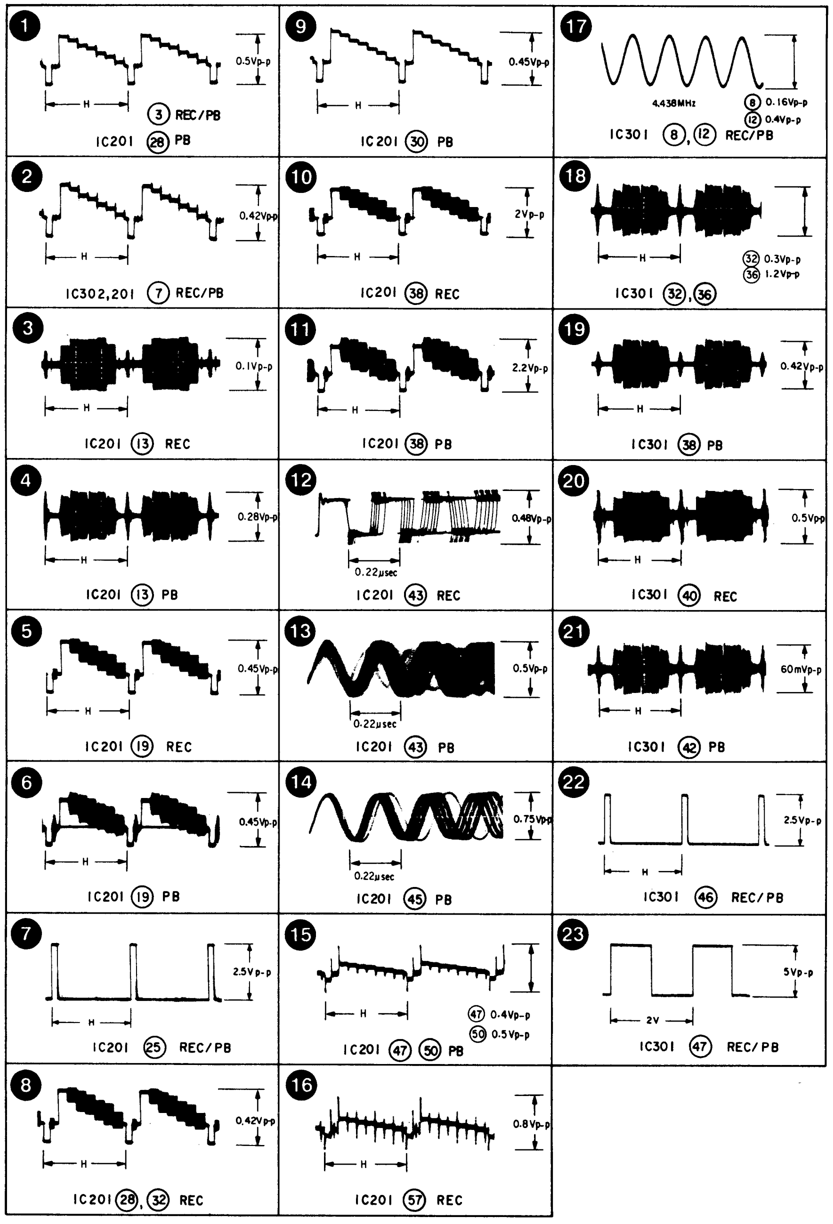
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VA-71 BOARD (1/3) (VIDEO (1) BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	
PB	⇨	⇨⇨	⇨⇨⇨	

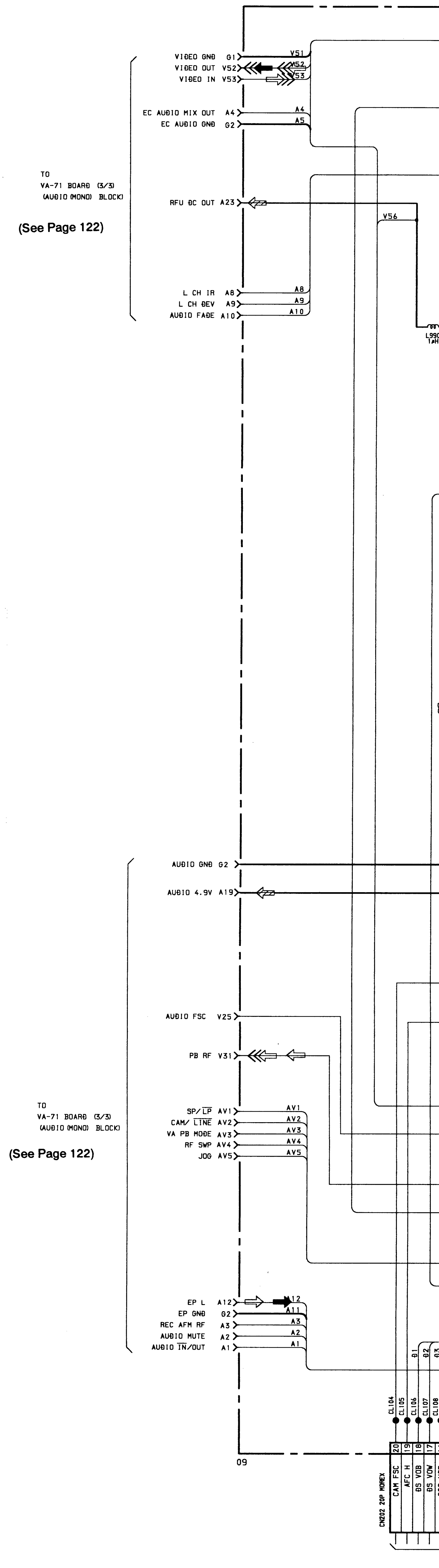
VA-71 BOARD (1/3)



VA-71 (VIDEO) SCHEMATIC DIAGRAM

- Refer to page 109 for Printed Wiring Board.

— Ref. No. VA-71 BOARD: 2000 series —


1
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A
B
C
D
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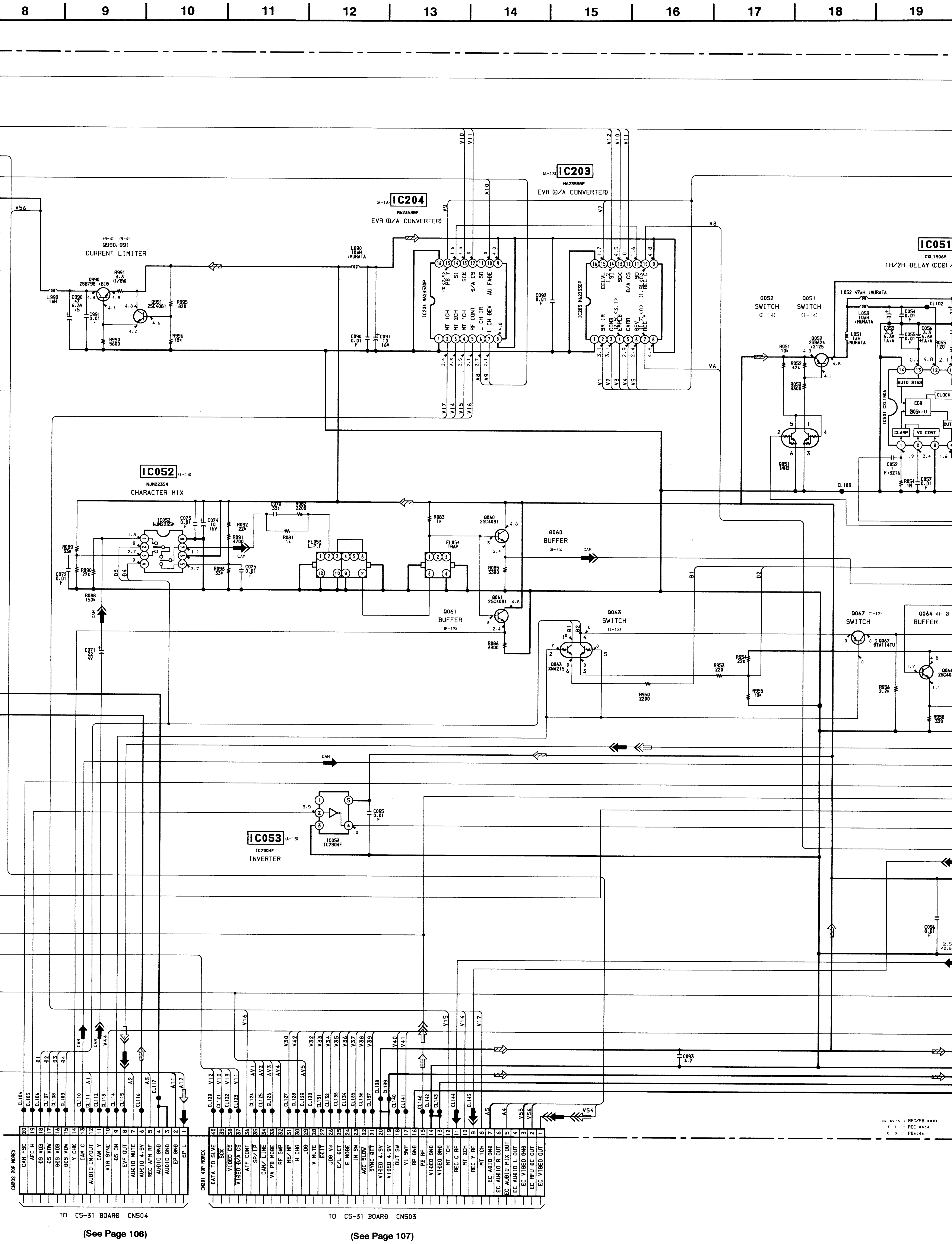
G
H
I
J
K
L
M
N
O
TO
VA-71 BOARD (3/3)
(AUDIO (MONO) BLOCK)
(See Page 122)
VIDEO GND G1
VIDEO OUT V52
VIDEO IN V53
V51
V52
V53
EC AUDIO MIX OUT A4
EC AUDIO GND G2
A4
A5
RFU DC OUT A23
V56
L CH IR A8
L CH DEV A9
AUDIO FADE A10
A8
A9
A10
L990
1µH
AUDIO GND G2
AUDIO 4.9V A19
AUDIO FSC V25
PB RF V31
TO
VA-71 BOARD (3/3)
(AUDIO (MONO) BLOCK)
(See Page 122)
SP/LP AV1
CAM/ LINE AV2
VA PB MODE AV3
RF SWP AV4
JOG AV5
AV1
AV2
AV3
AV4
AV5
EP L A12
EP GND G2
REC AFM RF A3
AUDIO MUTE A2
AUDIO IN/OUT A1
A12
A11
A3
A2
A1
D1
D2
D3
CL104
CL105
CL106
CL107
CL108
09
CN202 20P MOREX
20 CAM FSC
19 AFC H
18 DS VDB
17 DS VDW

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨


8
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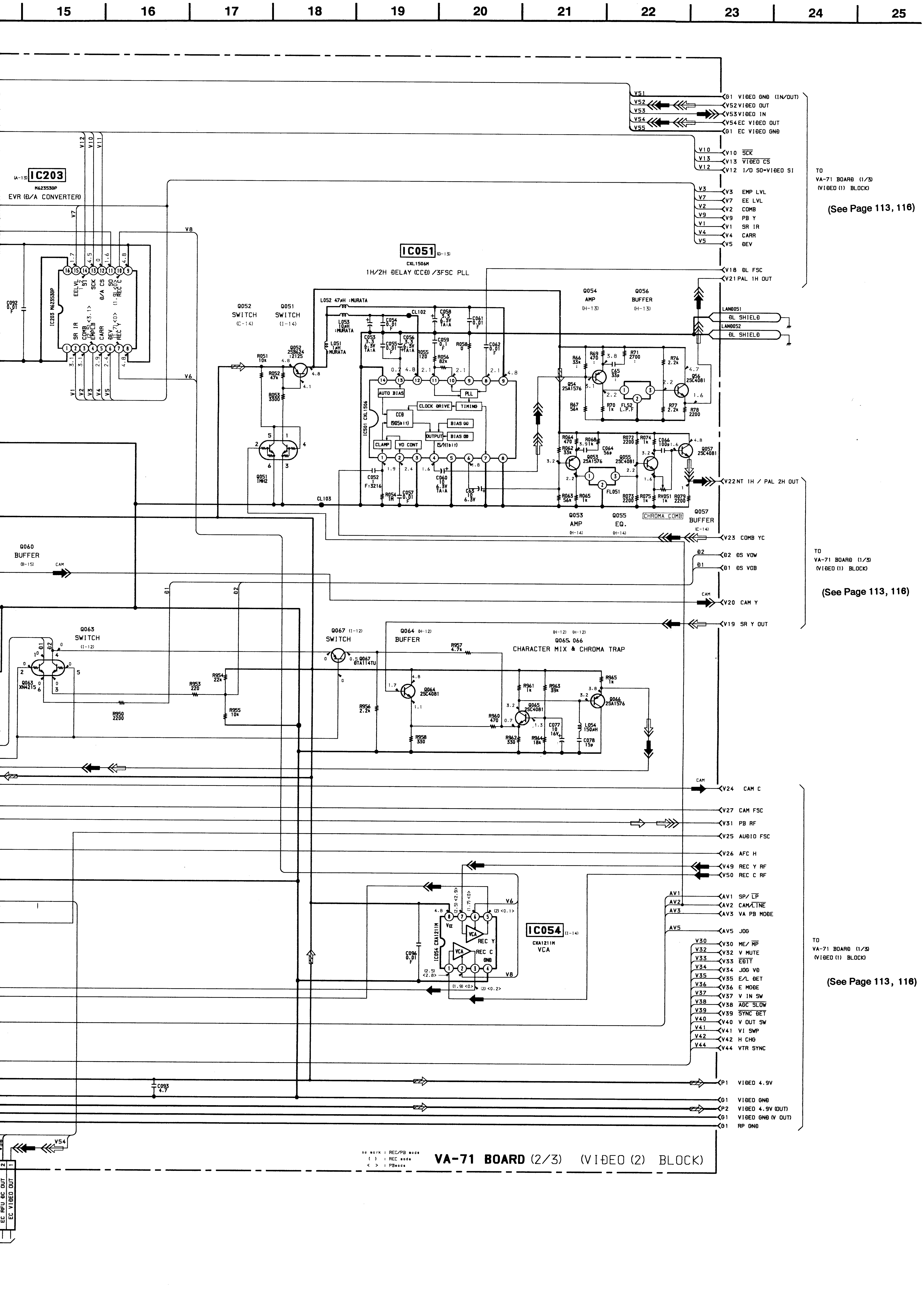
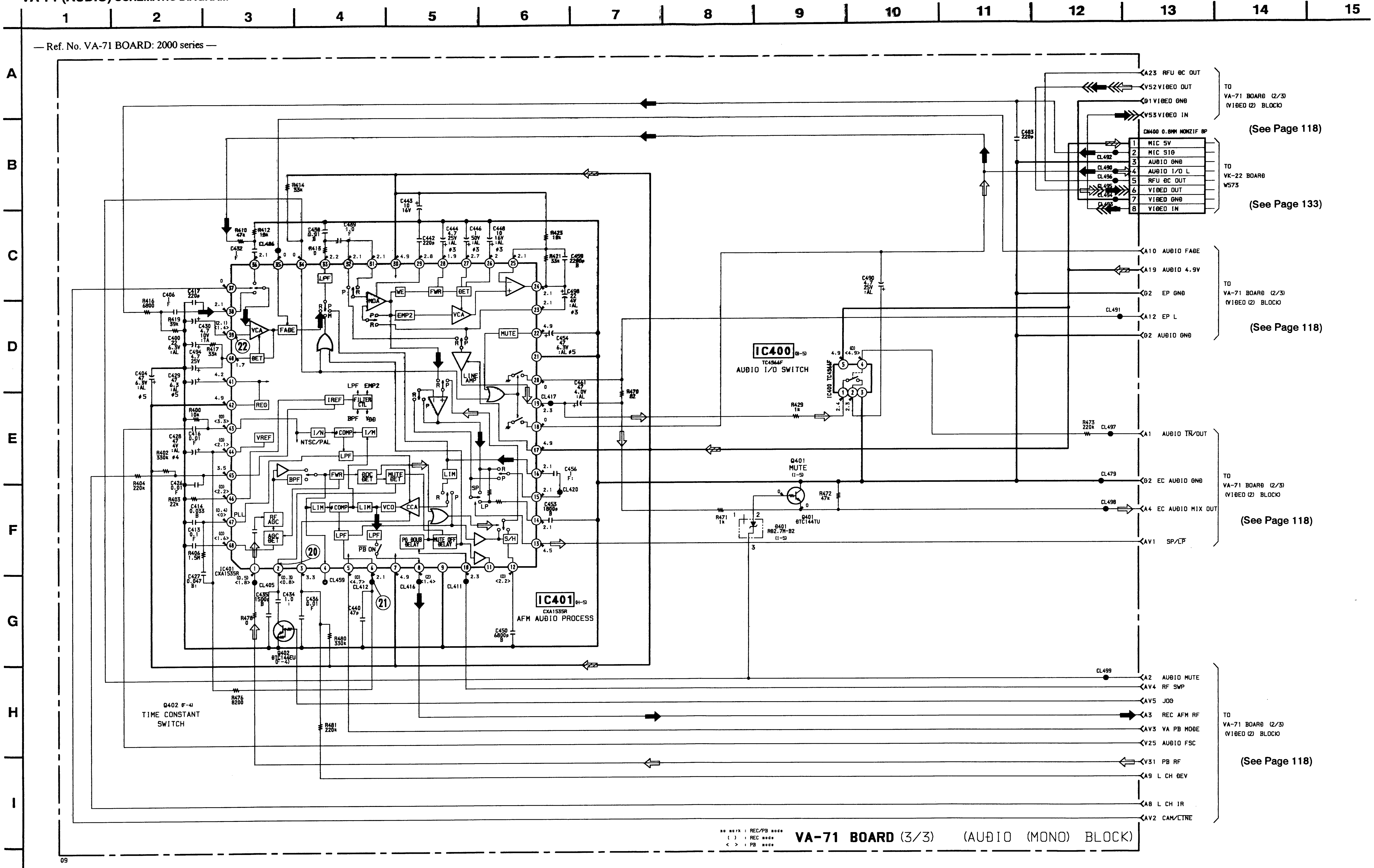
18
19
IC203 M62353OP EVR (D/A CONVERTER)
IC204 M62353OP EVR (D/A CONVERTER)
IC051 CXL1506M 1H/2H DELAY (CCD)
Q990, 991 CURRENT LIMITER
IC052 NJM2235M CHARACTER MIX
Q060 BUFFER
Q061 BUFFER
Q063 SWITCH
Q067 SWITCH
Q064 BUFFER
Q052 SWITCH
Q051 SWITCH
IC053 TC7S04F INVERTER
FL053 L.P.F
FL054 TRAP
AUTO BIAS
CLOCK
CCD
CLAMP
VD CONT
CN202 20P MOREX
CAM FSC
AFC H
DS VDD
DS VDD
DDS VDD
Y CHK
CAM C
AUDIO IN/OUT
CAM Y
VTR SYNC
DS ON
EVF OUT
AUDIO MUTE
AUDIO 4.9V
REC AFM RF
AUDIO GND
AUDIO GND
EP GND
EP L
TO CS-31 BOARD CN504
(See Page 106)
CN201 40P MOREX
DATA TO SLVE
SCK
VIDEO CS
VIDEO D/A CS
ATF CONT
SP/LP
CAM/LINE
VA PB MODE
RF SWP
ME/MP
H CHG
JOG
V MUTE
EDIT
JOG V4
E/L DET
E MODE
IN SW
AGC SLOW
SYNC DET
VIDEO 4.9V
VIDEO 4.9V
OUT SW
VI SWP
RP GND
PB RF
VIDEO GND
VIDEO GND
MT 'CH
REC C RF
MT 2CH
REC Y RF
MT 1CH
EC AUDIO R OUT
EC AUDIO MIX OUT
EC AUDIO L OUT
EC AUDIO GND
EC VIDEO GND
EC RFU DC OUT
EC VIDEO OUT
TO CS-31 BOARD CN503
(See Page 107)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VIDEO, AUDI


15
16
17
18
19
20
21
22
23
24
25
IC203
M62353OP
EVR (D/A CONVERTER)
IC051
CXL1506M
1H/2H DELAY (CCD) /3FSC PLL
Q052 SWITCH
Q051 SWITCH
Q054 AMP
Q056 BUFFER
Q053 AMP
Q055 EQ.
CHROMA COMB
Q057 BUFFER
Q060 BUFFER
Q063 SWITCH
Q067 SWITCH
Q064 BUFFER
Q065, 066 CHARACTER MIX & CHROMA TRAP
IC054
CXA1211M
VCA
AUTO BIAS
CLOCK DRIVE
TIMING
PLL
CCD
BIAS (A)
BIAS (B)
OUTPUT
CLAMP
VO CONT
DL SHIELD
G1 VIDEO GND (IN/OUT)
V52 VIDEO OUT
V53 VIDEO IN
V54 EC VIDEO OUT
G1 EC VIDEO GND
V10 SCK
V13 VIDEO CS
V12 I/O SO-VIDEO SI
V3 EMP LVL
V7 EE LVL
V2 COMB
V9 PB Y
V1 SR IR
V4 CARR
V5 DEV
V18 DL FSC
V21 PAL 1H OUT
V22 NT 1H / PAL 2H OUT
V23 COMB YC
D2 DS VDW
D1 DS VDB
V20 CAM Y
V19 SR Y OUT
V24 CAM C
V27 CAM FSC
V31 PB RF
V25 AUDIO FSC
V26 AFC H
V49 REC Y RF
V50 REC C RF
AV1 SP/LP
AV2 CAM/LINE
AV3 VA PB MODE
AV5 JOG
V30 ME/MP
V32 V MUTE
V33 EDIT
V34 JOG VD
V35 E/L DET
V36 E MODE
V37 V IN SW
V38 AGC SLOW
V39 SYNC DET
V40 V OUT SW
V41 VI SWP
V42 H CHG
V44 VTR SYNC
P1 VIDEO 4.9V
G1 VIDEO GND
P2 VIDEO 4.9V (OUT)
G1 VIDEO GND (V OUT)
G1 RP GND
TO VA-71 BOARD (1/3) (VIDEO (1) BLOCK)
(See Page 113, 116)
TO VA-71 BOARD (1/3) (VIDEO (1) BLOCK)
(See Page 113, 116)
TO VA-71 BOARD (1/3) (VIDEO (1) BLOCK)
(See Page 113, 116)
EC RFU DC OUT
EC VIDEO OUT
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
VA-71 BOARD (2/3) (VIDEO (2) BLOCK)

VA-71 (AUDIO) SCHEMATIC DIAGRAM

- Refer to page 109 for Printed Wiring Board.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
IC401 CXA1535R AFM AUDIO PROCESS
IC400 TC4S66F AUDIO I/O SWITCH
Q401 MUTE
Q402 TIME CONSTANT SWITCH
Q402 DTC144EU
Q401 DTC144TU
CN400 0.8MM NONZIF 8P
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
A23 RFU DC OUT
V52 VIDEO OUT
G1 VIDEO GND
V53 VIDEO IN
A10 AUDIO FADE
A19 AUDIO 4.9V
G2 EP GND
A12 EP L
G2 AUDIO GND
A1 AUDIO IN/OUT
G2 EC AUDIO GND
A4 EC AUDIO MIX OUT
AV1 SP/LP
A2 AUDIO MUTE
AV4 RF SWP
AV5 JOG
A3 REC AFM RF
AV3 VA PB MODE
V25 AUDIO FSC
V31 PB RF
A9 L CH DEV
A8 L CH IR
AV2 CAM/LINE
TO VA-71 BOARD (2/3) (VIDEO (2) BLOCK)
TO VK-22 BOARD W573
(See Page 118)
(See Page 133)
LPF
VCA
FADE
DET
REG
IREF
FILTER CTL
BPF
VREF
I/N
COMP
NTSC/PAL
FWR
DOC DET
MUTE DET
LIM
VCO
CCA
RF AGC
AGC DET
PLL
PB ON
PB DOUB DELAY
MUTE OFF DELAY
S/H
WE
EMP2
MUTE
LINE AMP
NDA
(20)
(21)
(22)
09

— Ref. No. VA-71 BOARD: 2000 series —

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VA-71 BOARD (3/3) (AUDIO (MONO) BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》》	➡
PB			⇨》》	⇨

SL-22 (MECH DRIVE) PRINTED WIRING BOARD

— Ref. No. SL-22 BOARD: 3000 series —

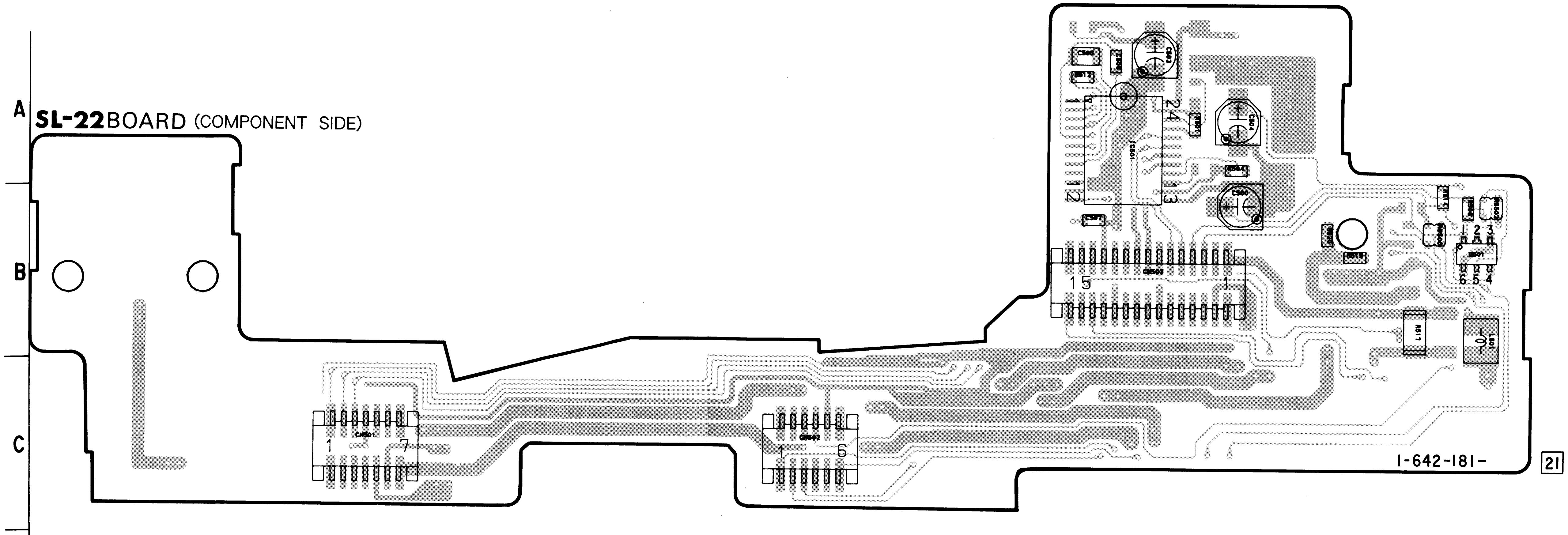
〈 IC 〉

IC501 8-759-059-09 IC LB8111V

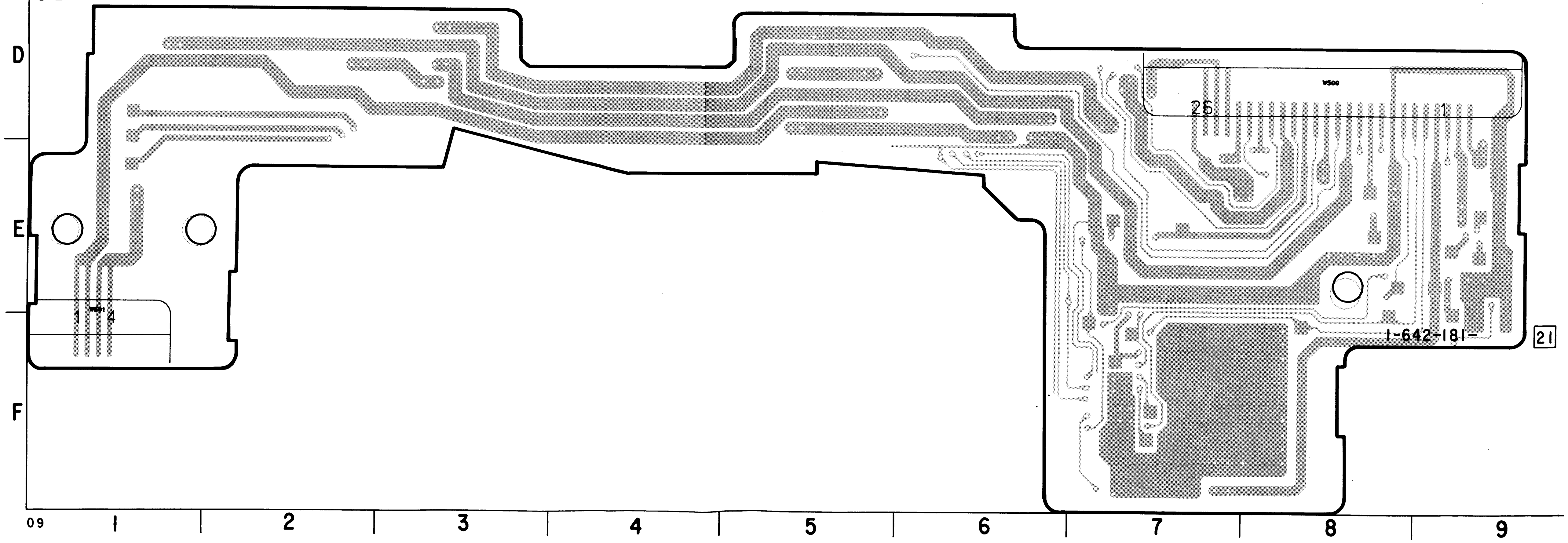
〈 TRANSISTOR 〉

Q501 8-729-402-81 TRANSISTOR XN4501

SL-22 BOARD (COMPONENT SIDE)

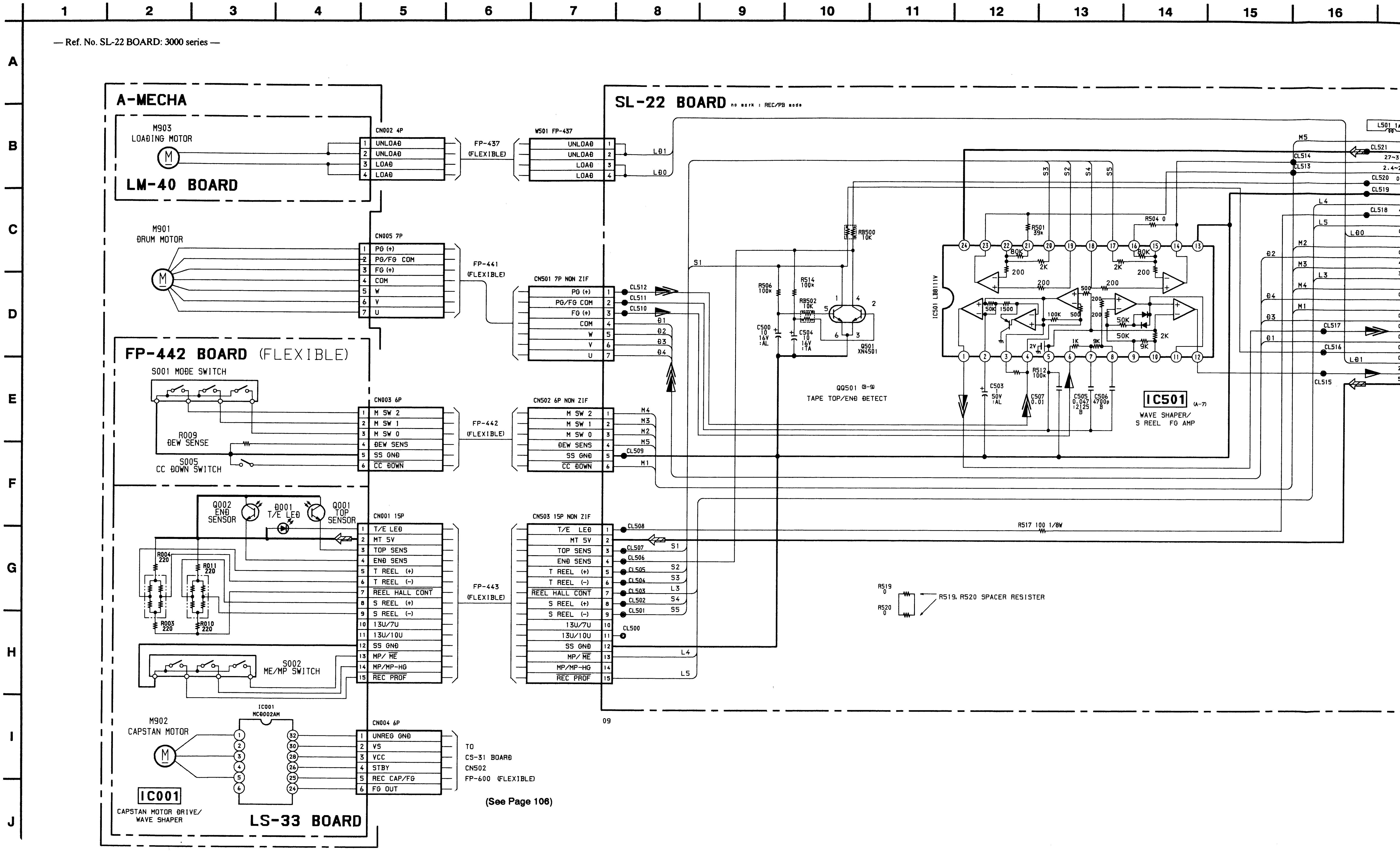

A
B
C
IC501
1
12
24
13
C502
C504
C500
CN503
15
1
Q501
1 2 3
6 5 4
R517
L501
CN501
1
7
CN502
1
6
1-642-181-
21

SL-22 BOARD (CONDUCTOR SIDE)

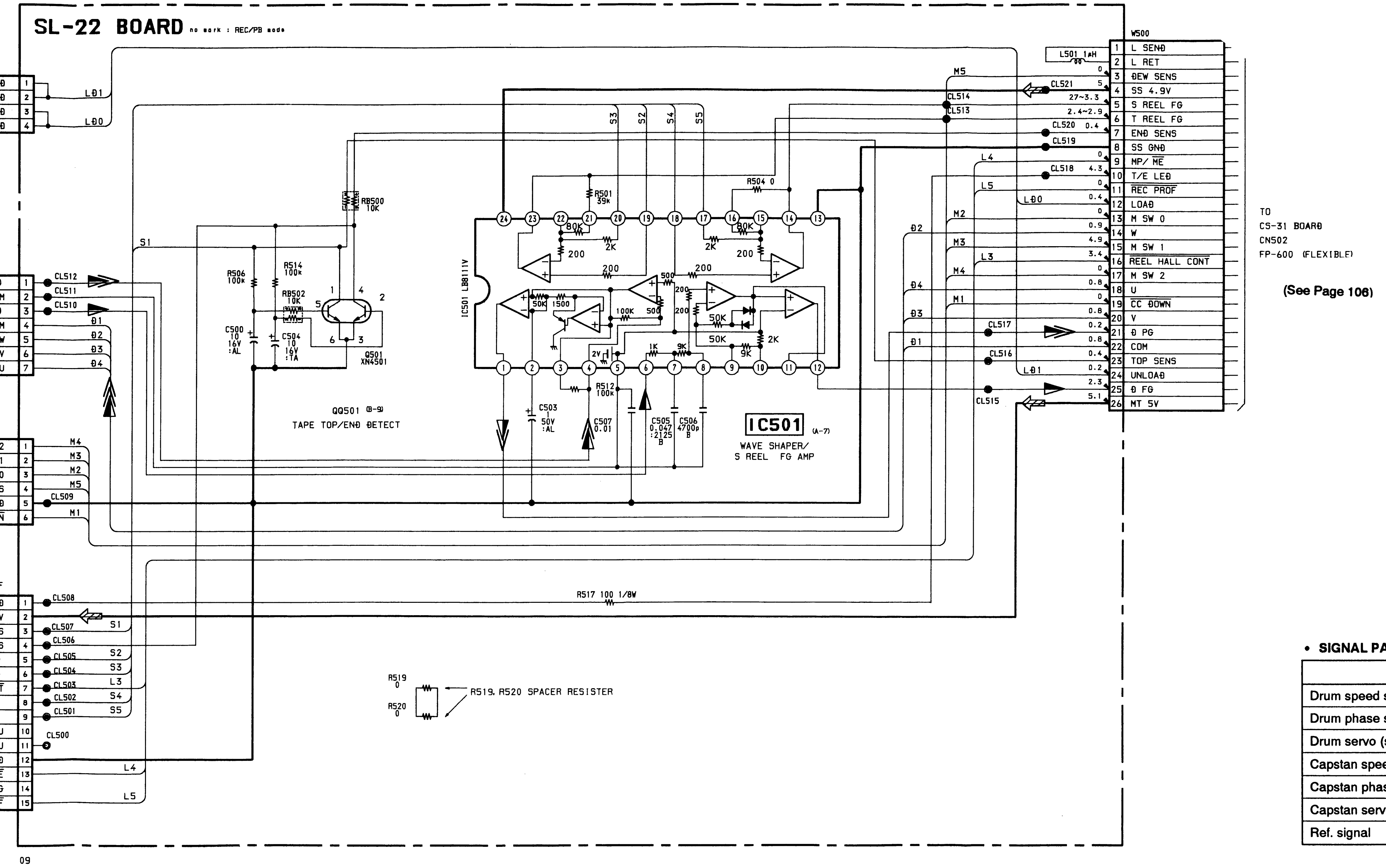

D
E
F
W500
26
1
W501
1
4
1-642-181-
21
09
1
2
3
4
5
6
7
8
9

SL-22 (MECH DRIVE) SCHEMATIC DIAGRAM

— Ref. No. SL-22 BOARD: 3000 series —



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
A-MECHA
M903 LOADING MOTOR
LM-40 BOARD
CN002 4P
UNLOAD
UNLOAD
LOAD
LOAD
FP-437 (FLEXIBLE)
W501 FP-437
M901 DRUM MOTOR
CN005 7P
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
FP-441 (FLEXIBLE)
CN501 7P NON ZIF
FP-442 BOARD (FLEXIBLE)
S001 MODE SWITCH
R009 DEW SENSE
S005 CC DOWN SWITCH
CN003 6P
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
FP-442 (FLEXIBLE)
CN502 6P NON ZIF
Q002 END SENSOR
D001 T/E LED
Q001 TOP SENSOR
R004 220
R011 220
R003 220
R010 220
S002 ME/MP SWITCH
CN001 15P
T/E LED
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13V/7V
13V/10V
SS GND
MP/ME
MP/MP-HG
REC PROF
FP-443 (FLEXIBLE)
CN503 15P NON ZIF
M902 CAPSTAN MOTOR
IC001 MC8002AM
IC001 CAPSTAN MOTOR DRIVE/ WAVE SHAPER
LS-33 BOARD
CN004 6P
UNREG GND
VS
VCC
STBY
REC CAP/FG
FG OUT
TO CS-31 BOARD CN502 FP-600 (FLEXIBLE)
(See Page 106)
SL-22 BOARD no mark : REC/PB mode
LD1
LD0
CL512
CL511
CL510
CL509
CL508
CL507
CL506
CL505
CL504
CL503
CL502
CL501
CL500
D1 D2 D3 D4
M1 M2 M3 M4 M5
S1 S2 S3 S4 S5
L3 L4 L5
RB500 10K
R506 100k
R514 100k
RB502 10K
C500 10 16V :AL
C504 10 16V :TA
Q501 XN4501
QQ501 (8-9) TAPE TOP/END DETECT
IC501 LB8111V
R501 39k
R504 0
80K
200
2K
50K
1500
100K
500
9K
1K
2V
R512 100k
C503 1 50V :AL
C507 0.01
C505 0.047 :2125 B
C506 4700p B
IC501 (A-7) WAVE SHAPER/ S REEL FG AMP
R517 100 1/8W
R519 0
R520 0
R519, R520 SPACER RESISTER
LS01
CL514
CL513
CL521
CL520
CL519
CL518
CL517
CL516
CL515
09


SL-22 BOARD no mark : REC/PB mode
LÐ1
LÐ0
S1
CL512
CL511
CL510
Ð1
Ð2
Ð3
Ð4
M4
M3
M2
M5
CL509
M1
RB500 10K
R506 100k
R514 100k
RB502 10K
C500 10 16V :AL
C504 10 16V :TA
Q501 XN4501
QQ501 (B-9)
TAPE TOP/END DETECT
IC501 LB8111V
S3
S2
S4
S5
R501 39k
R504 0
80K
2K
200
500
50K
1500
100K
2V
1K
9K
R512 100k
C503 1 50V :AL
C507 0.01
C505 0.047 :2125 B
C506 4700p B
IC501 (A-7)
WAVE SHAPER/
S REEL FG AMP
L501 1μH
M5
CL521
CL514
CL513
CL520
CL519
L4
CL518
L5
LÐ0
M2
Ð2
M3
L3
M4
Ð4
M1
Ð3
CL517
Ð1
CL516
LÐ1
CL515
W500
1 L SENÐ
2 L RET
3 ÐEW SENS
4 SS 4.9V
5 S REEL FG
6 T REEL FG
7 ENÐ SENS
8 SS GNÐ
9 MP/ ME
10 T/E LEÐ
11 REC PROF
12 LOAÐ
13 M SW 0
14 W
15 M SW 1
16 REEL HALL CONT
17 M SW 2
18 U
19 CC ÐOWN
20 V
21 Ð PG
22 COM
23 TOP SENS
24 UNLOAÐ
25 Ð FG
26 MT 5V
0
5
27~3.3
2.4~2.9
0.4
0
4.3
0
0.4
0
0.9
4.9
3.4
0
0.8
0
0.8
0.2
0.8
0.4
0.2
2.3
5.1
TO
CS-31 BOARÐ
CN502
FP-600 (FLEXIBLE)
CL508
CL507
CL506
CL505
CL504
CL503
CL502
CL501
CL500
S1
S2
S3
L3
S4
S5
L4
L5
R517 100 1/8W
R519 0
R520 0
R519, R520 SPACER RESISTER
09

(See Page 106)

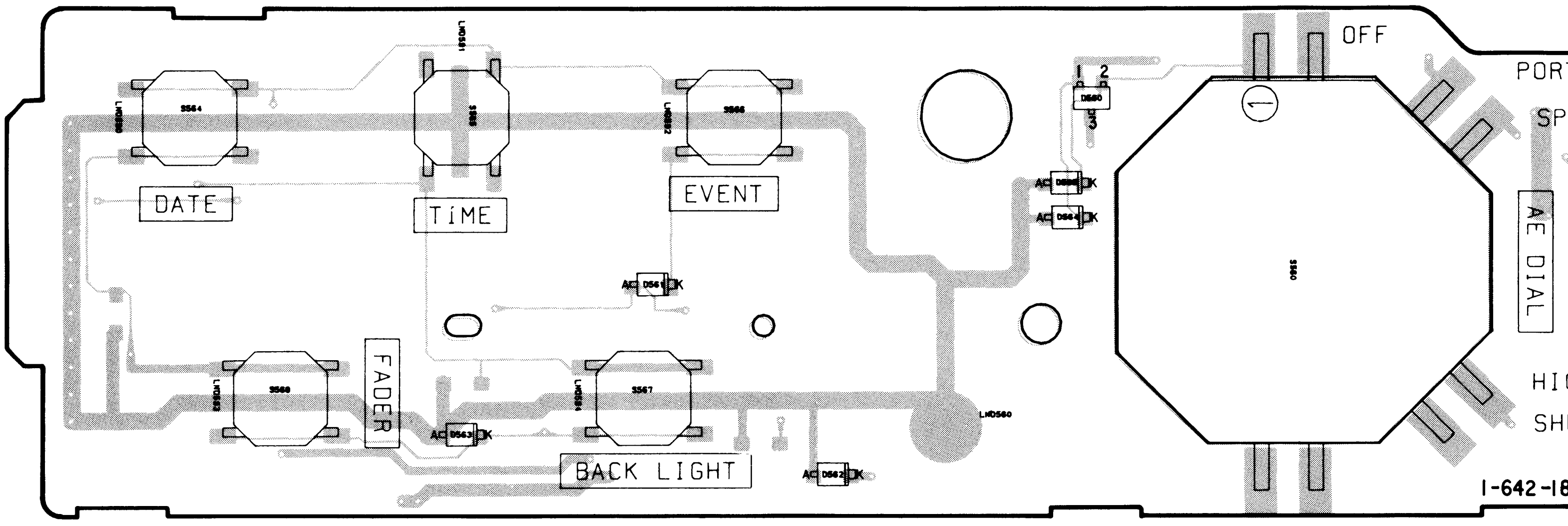
- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷›	
Drum servo (speed and phase)		▷»	
Capstan speed servo			
Capstan phase servo	➤»	➤›››	▷»
Capstan servo (speed and phase)		➤»	
Ref. signal			

CK-47 (CAMERA CONTROL SWITCH), PK-30 (VTR/CAMERA SWITCH), DK-20 (RESET SWITCH), SW-200 (CAMERA START/STOP), VK

— Ref. No. MA-93 BOARD: 3000 series, VK-22 BOARD: 4000 series, SW-200 BOARD: 5000 series, CK-47 BOARD: 6000 series, DK-20 BOARD: 7000 series, PK-30 BOARD: 8000 series, P

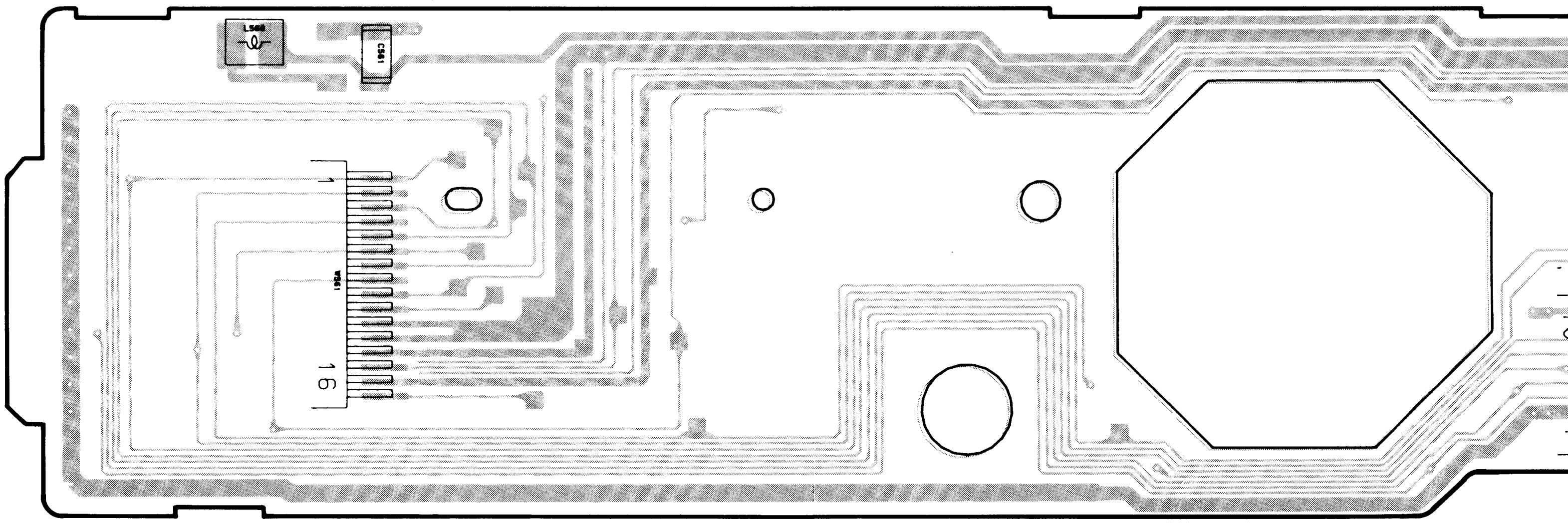
CK-47 BOARD (COMPONENT SIDE)


DATE
TIME
EVENT
FADER
BACK LIGHT
OFF
PORT
SP
AE DIAL
HI
SH
S564
S565
S566
S563
S567
S560
D560
D561
D562
D563
D564
D565
AC
K
1
2
3
LND560
I-642-18

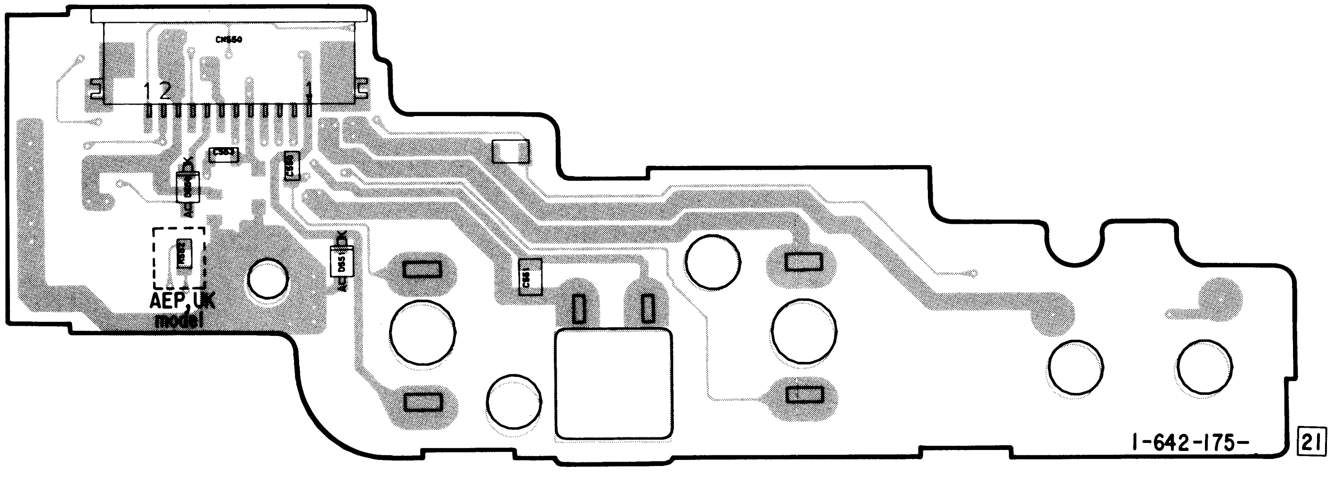
(DIODE)

D560	8-719-820-05	DIODE	1SS181
D561	8-719-404-46	DIODE	MA110
D562	8-719-110-03	DIODE	RD7. 5ES-B2
D563	8-719-110-03	DIODE	RD7. 5ES-B2
D564	8-719-110-03	DIODE	RD7. 5ES-B2
D565	8-719-110-03	DIODE	RD7. 5ES-B2

CK-47 BOARD (CONDUCTOR SIDE)


L566
C561
CN561
1
16

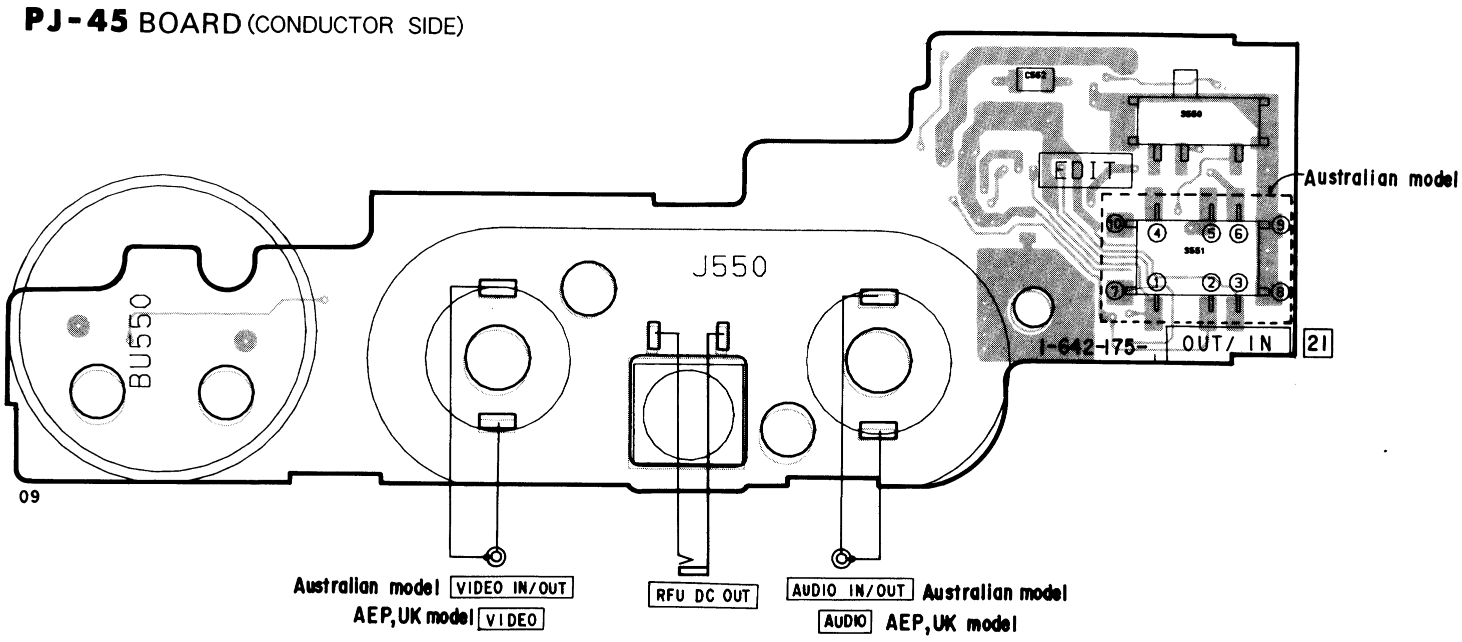
PJ-45 BOARD (COMPONENT SIDE)


CN550
12
1
C552
D550
D551
D552
C551
AC
K
AEP,UK model
1-642-175-
21

(DIODE)

D550	8-719-404-46	DIODE	MA110
D551	8-719-110-03	DIODE	RD7. 5ES-B2
D552	8-719-110-03	DIODE	RD7. 5ES-B2

PJ-45 BOARD (CONDUCTOR SIDE)


C562
S550
EDIT
S551
Australian model
④
⑤
⑥
⑦
①
②
③
⑧
⑨
⑩
J550
BU550
1-642-175-
OUT/ IN
21
09
Australian model VIDEO IN/OUT
AEP,UK model VIDEO
RFU DC OUT
AUDIO IN/OUT Australian model
AUDIO AEP,UK model

PK-30 BOARD: 8000 series, PJ-45 BOARD: 9000 series —

〈 DIODE 〉

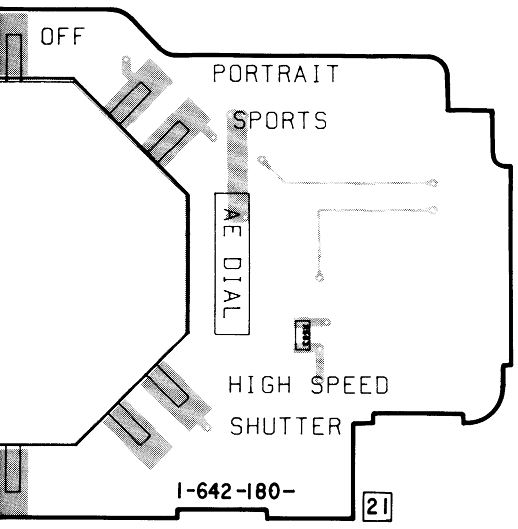
D400	8-719-110-03	DIODE	RD7. 5ES-B2
D401	8-719-110-03	DIODE	RD7. 5ES-B2

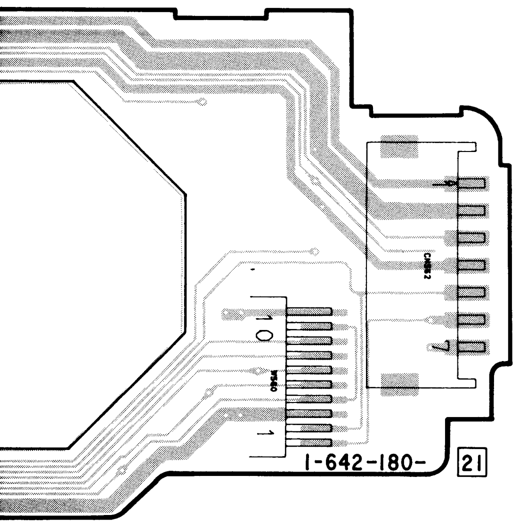
〈 IC 〉

IC400	8-759-822-37	IC	LA7293M-TE-L
IC401	8-749-923-29	IC	RS-20E-T

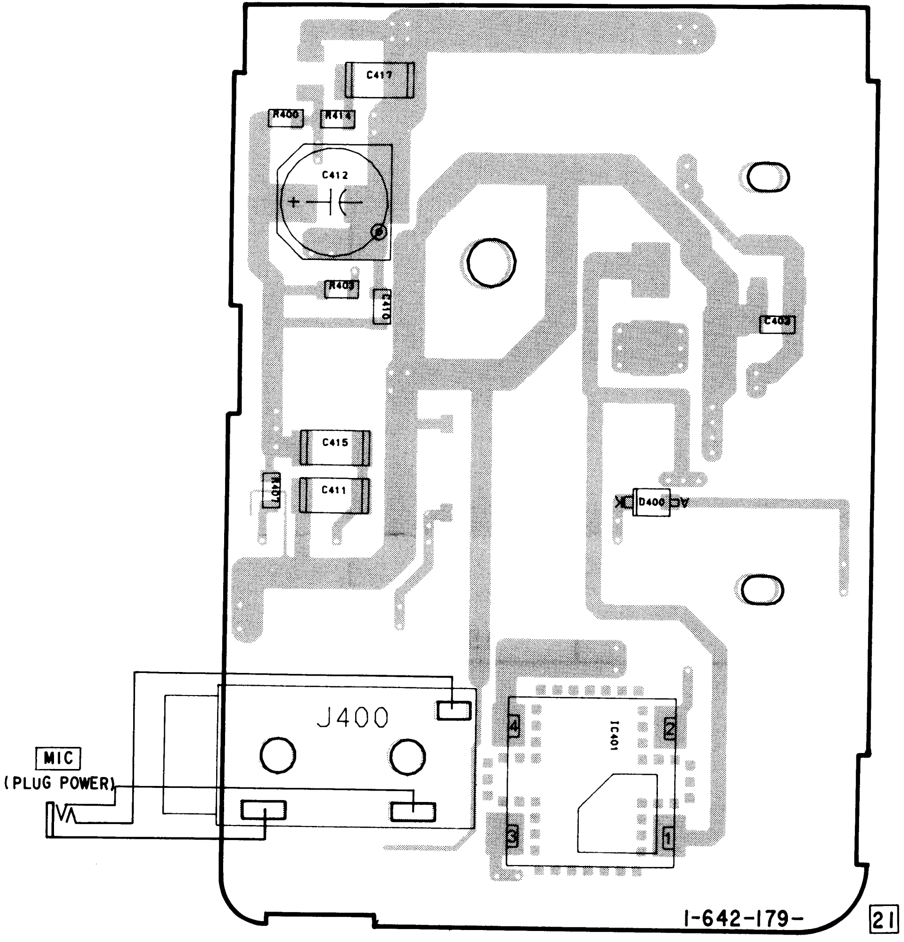
〈 TRANSISTOR 〉

Q400	8-729-905-23	TRANSISTOR	2SA1576-R

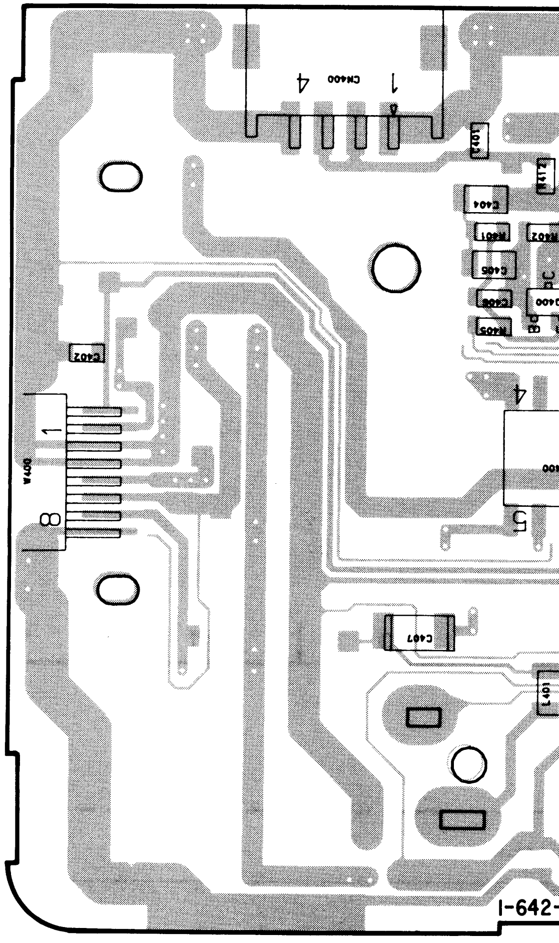

OFF
PORTRAIT
SPORTS
AE DIAL
HIGH SPEED
SHUTTER
1-642-180-
21


4
7
10
1
1-642-180-
21

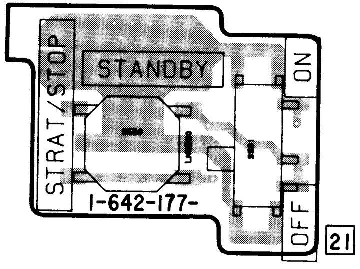
MA-93 BOARD (COMPONENT SIDE)


C417
R406
R414
C412
R403
C410
C403
C415
C411
R407
D400
J400
MIC
(PLUG POWER)
IC401
4
2
3
1
1-642-179-
21

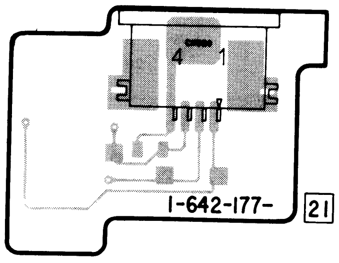
MA-93 BOARD (CONDUCTOR SIDE)


CN400
4
1
C404
C402
1
8
C407
4
5
1-642-

SW-200 BOARD (COMPONENT SIDE)

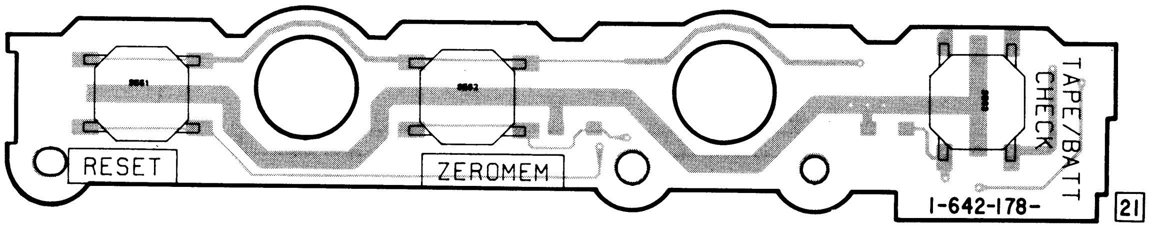

STRAT/STOP
STANDBY
ON
OFF
1-642-177-
21

SW-200 BOARD (CONDUCTOR SIDE)


4
1
1-642-177-
21

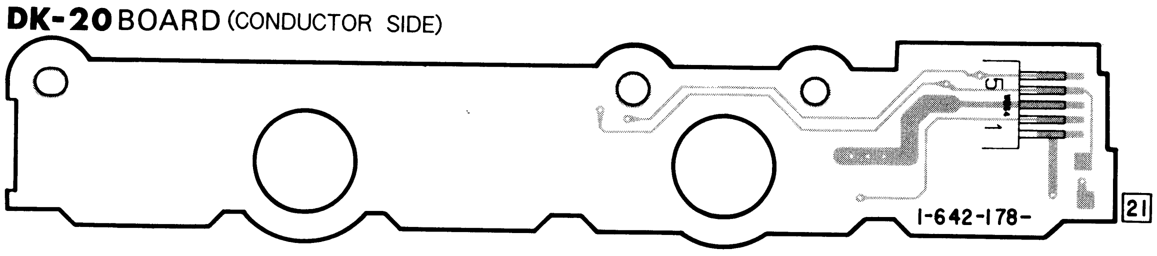
21

DK-20 BOARD (COMPONENT SIDE)


RESET
ZEROMEM
TAPE/BATT CHECK
1-642-178-
21

Australian model

DK-20 BOARD (CONDUCTOR SIDE)


5
1
1-642-178-
21

21

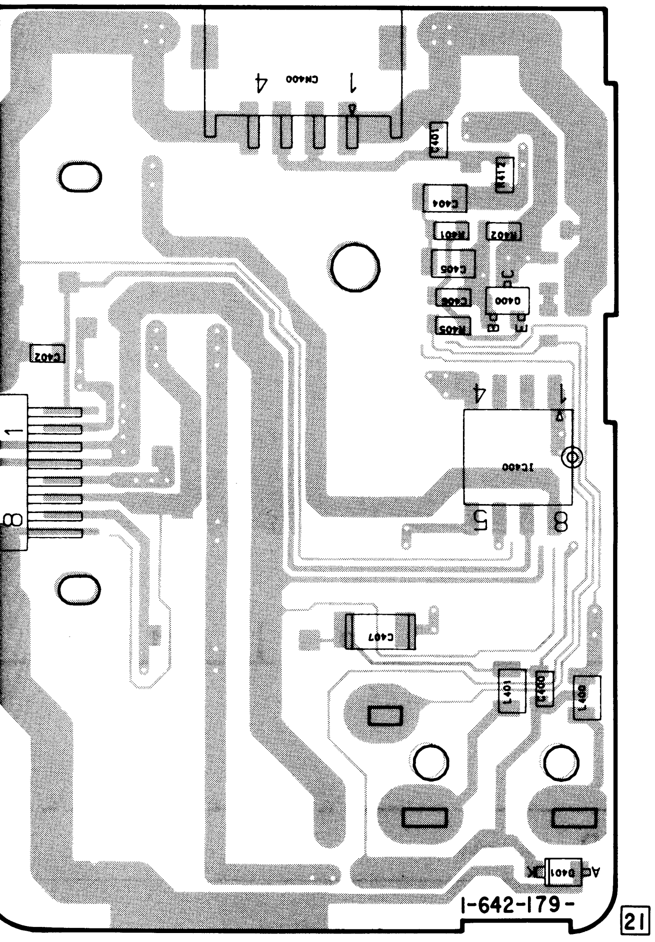
(TRANSISTOR)

Q400 8-729-905-23 TRANSISTOR 2SA1576-R

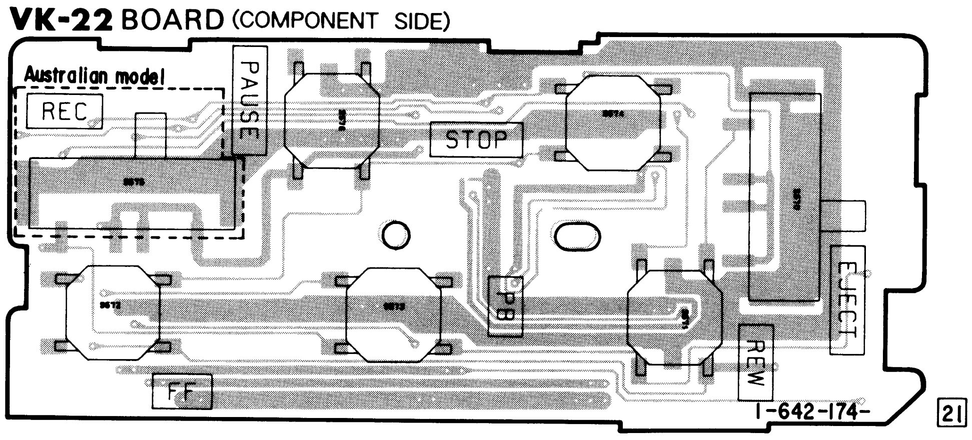
(DIODE)

D570 8-719-820-05 DIODE 1SS181

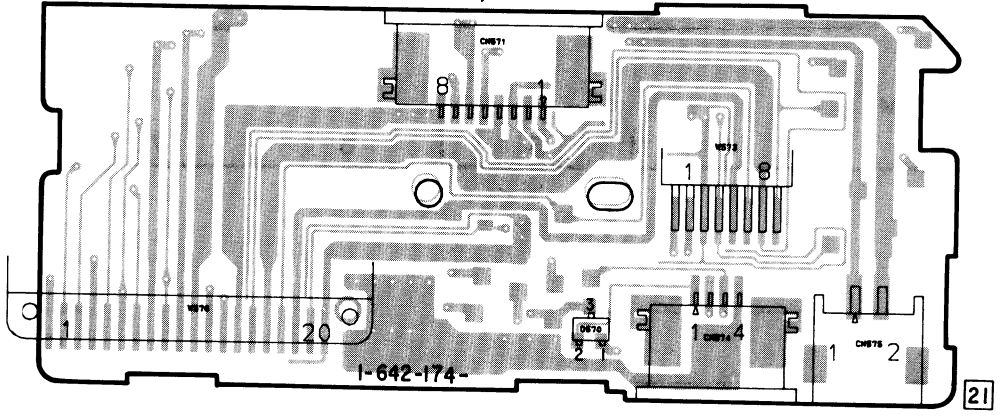
A-93 BOARD (CONDUCTOR SIDE)


CN400
4
1
C404
R401
R402
C405
Q400
C406
R405
C402
IC400
4
1
5
8
C407
L401
D402
D401
1-642-179-
21

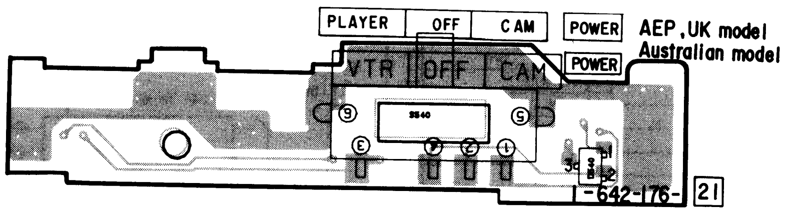
VK-22 BOARD (COMPONENT SIDE)


Australian model
REC
PAUSE
STOP
PB
EJECT
REW
FF
1-642-174-
21

VK-22 BOARD (CONDUCTOR SIDE)


CN571
8
1
CN572
1
8
CN570
1
20
D570
2
1
CN574
1
4
CN575
1
2
1-642-174-
21

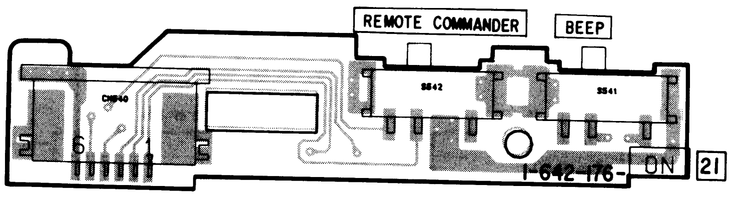
PK-30 BOARD (COMPONENT SIDE)

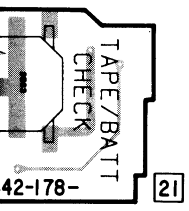

PLAYER
OFF
CAM
POWER
AEP,UK model
VTR
OFF
CAM
POWER
Australian model
S540
D540
1-642-176-
21

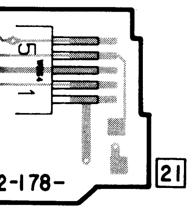
(DIODE)

D540 8-719-820-05 DIODE 1SS181

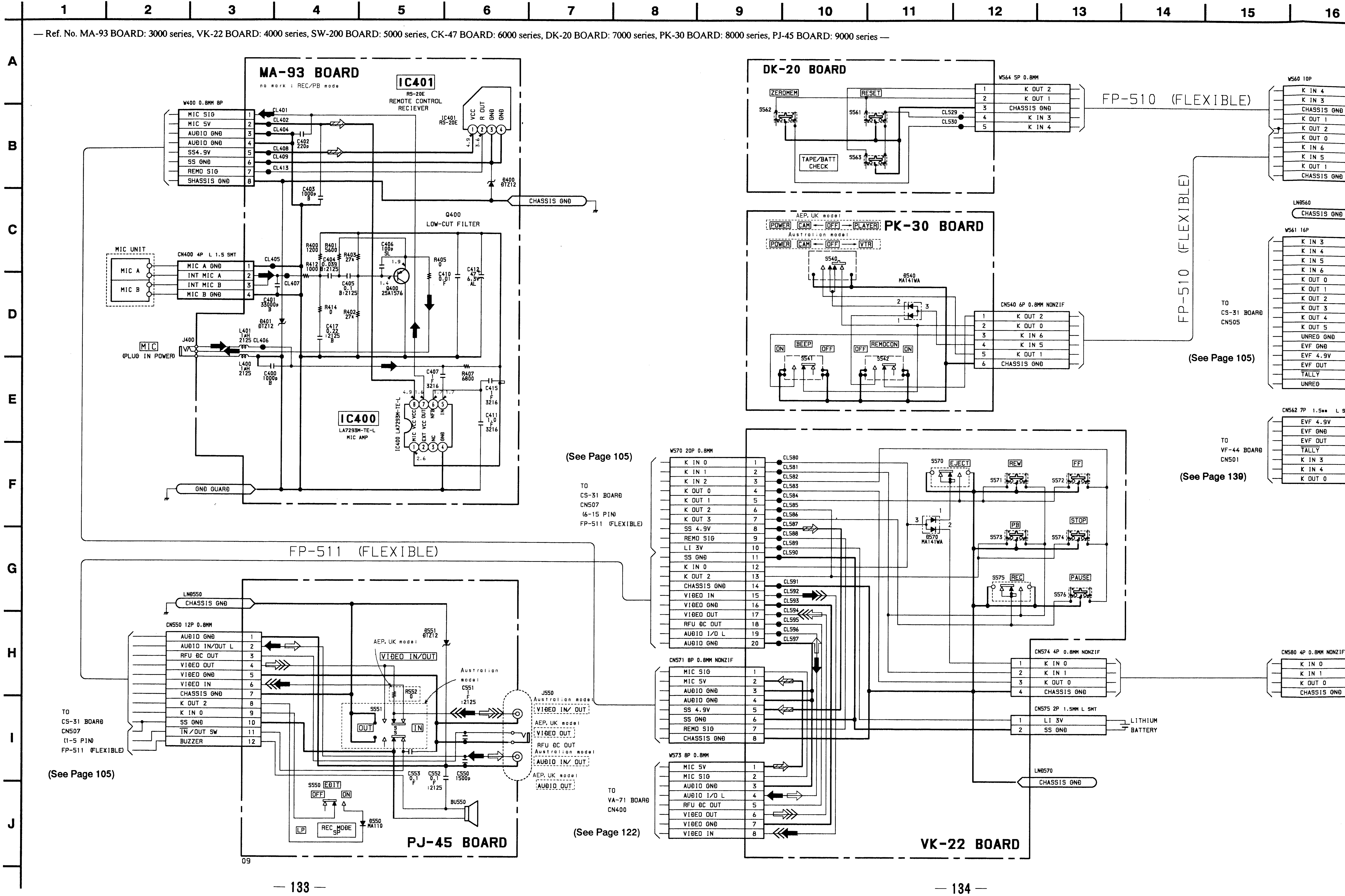
PK-30 BOARD(CONDUCTOR SIDE)


REMOTE COMMANDER
BEEP
CN540
6
1
S542
S541
1-642-176-
ON
21


TAPE/BATT
CHECK
42-178-
21



CK-47 (CAMERA CONTROL SWITCH), PK-30 (VTR/CAMERA SWITCH), DK-20 (RESET SWITCH), SW-200 (CAMERA START/STOP), VK-22 (VTR CONTROL SWITCH), MA-93 (MIC AMP), PJ-45 (VIDEO/AUDIO IN/OUT) SCHEMATIC DIAGRAMS



— Ref. No. MA-93 BOARD: 3000 series, VK-22 BOARD: 4000 series, SW-200 BOARD: 5000 series, CK-47 BOARD: 6000 series, DK-20 BOARD: 7000 series, PK-30 BOARD: 8000 series, PJ-45 BOARD: 9000 series —

1
2
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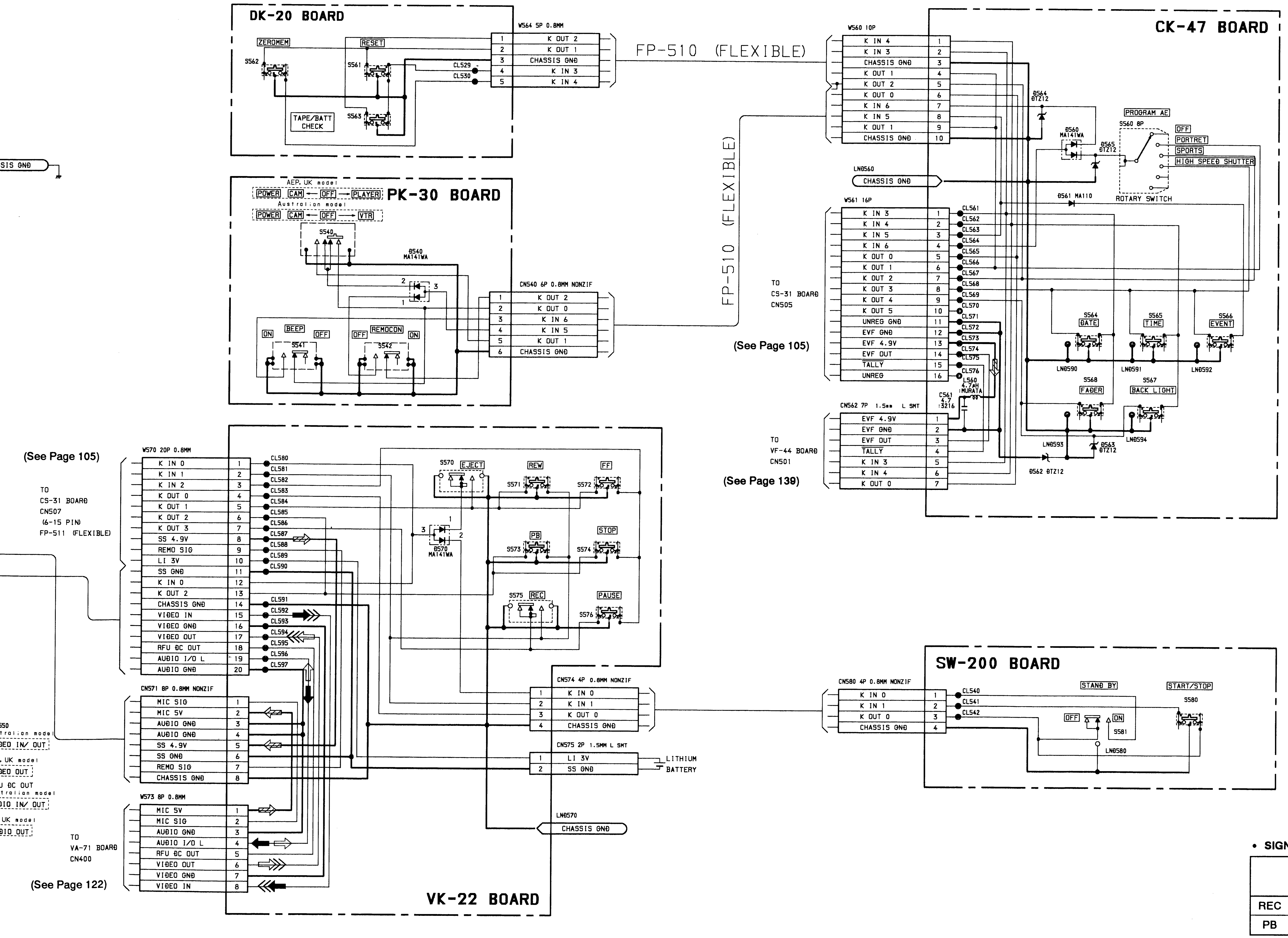
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
MA-93 BOARD
no mark : REC/PB mode
IC401
RS-20E
REMOTE CONTROL
RECIEVER
W400 0.8MM 8P
MIC SIG
MIC 5V
AUDIO GND
AUDIO GND
SS4.9V
SS GND
REMO SIG
SHASSIS GND
CHASSIS GND
Q400
LOW-CUT FILTER
MIC UNIT
MIC A
MIC B
CN400 4P L 1.5 SMT
MIC A GND
INT MIC A
INT MIC B
MIC B GND
MIC
(PLUG IN POWER)
J400
IC400
LA7293M-TE-L
MIC AMP
GND GUARD
FP-511 (FLEXIBLE)
DK-20 BOARD
W564 5P 0.8MM
ZEROMEM
RESET
TAPE/BATT
CHECK
K OUT 2
K OUT 1
CHASSIS GND
K IN 3
K IN 4
FP-510 (FLEXIBLE)
PK-30 BOARD
AEP, UK model
POWER CAM OFF PLAYER
Australian model
POWER CAM OFF VTR
BEEP
REMOCON
ON
OFF
CN540 6P 0.8MM NONZIF
K OUT 2
K OUT 0
K IN 6
K IN 5
K OUT 1
CHASSIS GND
TO
CS-31 BOARD
CN505
(See Page 105)
W560 10P
K IN 4
K IN 3
CHASSIS GND
K OUT 1
K OUT 2
K OUT 0
K IN 6
K IN 5
K OUT 1
CHASSIS GND
LND560
CHASSIS GND
W561 16P
K IN 3
K IN 4
K IN 5
K IN 6
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
UNREG GND
EVF GND
EVF 4.9V
EVF OUT
TALLY
UNREG
CN562 7P 1.5mm
EVF 4.9V
EVF GND
EVF OUT
TALLY
K IN 3
K IN 4
K OUT 0
TO
VF-44 BOARD
CN501
(See Page 139)
(See Page 105)
TO
CS-31 BOARD
CN507
(6-15 PIN)
FP-511 (FLEXIBLE)
W570 20P 0.8MM
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
SS 4.9V
REMO SIG
LI 3V
SS GND
K IN 0
K OUT 2
CHASSIS GND
VIDEO IN
VIDEO GND
VIDEO OUT
RFU DC OUT
AUDIO I/O L
AUDIO GND
EJECT
REW
FF
PB
STOP
REC
PAUSE
CN571 8P 0.8MM NONZIF
MIC SIG
MIC 5V
AUDIO GND
AUDIO GND
SS 4.9V
SS GND
REMO SIG
CHASSIS GND
W573 8P 0.8MM
MIC 5V
MIC SIG
AUDIO GND
AUDIO I/O L
RFU DC OUT
VIDEO OUT
VIDEO GND
VIDEO IN
TO
VA-71 BOARD
CN400
(See Page 122)
CN574 4P 0.8MM NONZIF
K IN 0
K IN 1
K OUT 0
CHASSIS GND
CN575 2P 1.5MM L SMT
LI 3V
SS GND
LITHIUM
BATTERY
LND570
CHASSIS GND
VK-22 BOARD
CN580 4P 0.8MM NONZIF
K IN 0
K IN 1
K OUT 0
CHASSIS GND
LND550
CHASSIS GND
CN550 12P 0.8MM
AUDIO GND
AUDIO IN/OUT L
RFU DC OUT
VIDEO OUT
VIDEO GND
VIDEO IN
CHASSIS GND
K OUT 2
K IN 0
SS GND
IN/OUT SW
BUZZER
TO
CS-31 BOARD
CN507
(1-5 PIN)
FP-511 (FLEXIBLE)
(See Page 105)
AEP, UK model
VIDEO IN/OUT
OUT
IN
Australian model
J550
VIDEO IN/OUT
VIDEO OUT
RFU DC OUT
AUDIO IN/OUT
AUDIO OUT
S550 EDIT
OFF
ON
LP
REC MODE
SP
BU550
PJ-45 BOARD
09

DK-20 BOARD: 7000 series, PK-30 BOARD: 8000 series, PJ-45 BOARD: 9000 series —

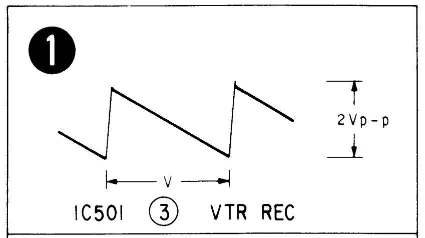

DK-20 BOARD
ZEROMEM
RESET
S562
S561
S563
TAPE/BATT CHECK
CL529
CL530
W564 5P 0.8MM
1 K OUT 2
2 K OUT 1
3 CHASSIS GND
4 K IN 3
5 K IN 4
FP-510 (FLEXIBLE)
SIS GND
PK-30 BOARD
AEP, UK model
POWER CAM OFF PLAYER
Australian model
POWER CAM OFF VTR
S540
D540 MA141WA
BEEP
ON
OFF
S541
REMOCON
S542
CN540 6P 0.8MM NONZIF
1 K OUT 2
2 K OUT 0
3 K IN 6
4 K IN 5
5 K OUT 1
6 CHASSIS GND
FP-510 (FLEXIBLE)
CK-47 BOARD
W560 10P
1 K IN 4
2 K IN 3
3 CHASSIS GND
4 K OUT 1
5 K OUT 2
6 K OUT 0
7 K IN 6
8 K IN 5
9 K OUT 1
10 CHASSIS GND
D564 DTZ12
D560 MA141WA
D565 DTZ12
PROGRAM AE
S560 8P
OFF
PORTRET
SPORTS
HIGH SPEED SHUTTER
ROTARY SWITCH
LND560
CHASSIS GND
D561 MA110
W561 16P
1 K IN 3
2 K IN 4
3 K IN 5
4 K IN 6
5 K OUT 0
6 K OUT 1
7 K OUT 2
8 K OUT 3
9 K OUT 4
10 K OUT 5
11 UNREG GND
12 EVF GND
13 EVF 4.9V
14 EVF OUT
15 TALLY
16 UNREG
CL561 CL562 CL563 CL564 CL565 CL566 CL567 CL568 CL569 CL570 CL571 CL572 CL573 CL574 CL575 CL576
TO CS-31 BOARD CN505
(See Page 105)
S564 DATE
S565 TIME
S566 EVENT
LND590
LND591
LND592
S568 FADER
S567 BACK LIGHT
L560 4.7μH :MURATA
C561 4.7 :3216
CN562 7P 1.5mm L SMT
1 EVF 4.9V
2 EVF GND
3 EVF OUT
4 TALLY
5 K IN 3
6 K IN 4
7 K OUT 0
TO VF-44 BOARD CN501
(See Page 139)
LND593
D563 DTZ12
LND594
D562 DTZ12
(See Page 105)
TO CS-31 BOARD CN507 (6-15 PIN) FP-511 (FLEXIBLE)
W570 20P 0.8MM
1 K IN 0
2 K IN 1
3 K IN 2
4 K OUT 0
5 K OUT 1
6 K OUT 2
7 K OUT 3
8 SS 4.9V
9 REMO SIG
10 LI 3V
11 SS GND
12 K IN 0
13 K OUT 2
14 CHASSIS GND
15 VIDEO IN
16 VIDEO GND
17 VIDEO OUT
18 RFU DC OUT
19 AUDIO I/O L
20 AUDIO GND
CL580 CL581 CL582 CL583 CL584 CL585 CL586 CL587 CL588 CL589 CL590 CL591 CL592 CL593 CL594 CL595 CL596 CL597
S570 EJECT
REW
FF
S571
S572
D570 MA141WA
PB
STOP
S573
S574
S575 REC
PAUSE
S576
CN571 8P 0.8MM NONZIF
1 MIC SIG
2 MIC 5V
3 AUDIO GND
4 AUDIO GND
5 SS 4.9V
6 SS GND
7 REMO SIG
8 CHASSIS GND
550
tralian model
EO IN/ OUT
UK model
EO OUT
J DC OUT
tralian model
DIO IN/ OUT
UK model
DIO OUT
W573 8P 0.8MM
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
TO VA-71 BOARD CN400
(See Page 122)
CN574 4P 0.8MM NONZIF
1 K IN 0
2 K IN 1
3 K OUT 0
4 CHASSIS GND
CN575 2P 1.5MM L SMT
1 LI 3V
2 SS GND
LITHIUM BATTERY
LND570
CHASSIS GND
VK-22 BOARD
SW-200 BOARD
CN580 4P 0.8MM NONZIF
1 K IN 0
2 K IN 1
3 K OUT 0
4 CHASSIS GND
CL540 CL541 CL542
STAND BY
OFF
ON
S581
LND580
START/STOP
S580

• SIGNAL PATH

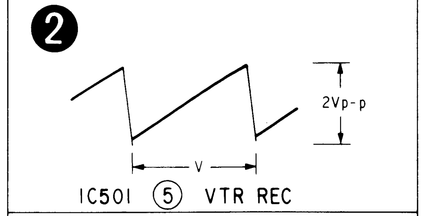
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

VF-44 BOARD

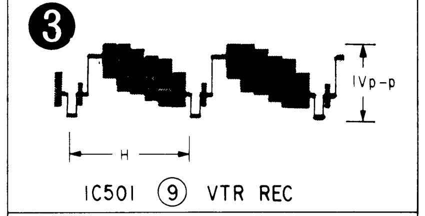
❶



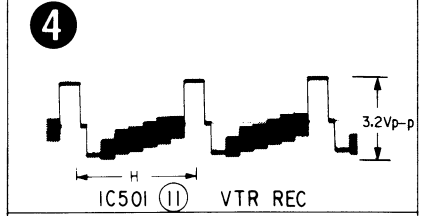
❷



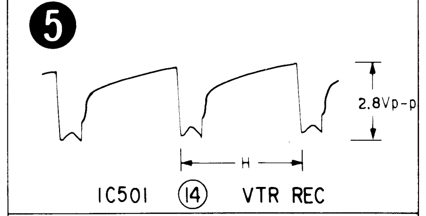
❸



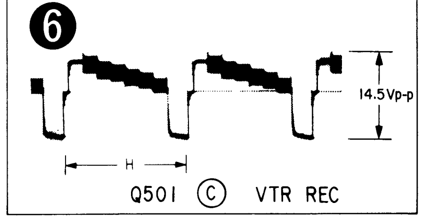
❹



❺



❻



(DIODE)

D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

(IC)

IC501	8-759-420-01	IC	AN2512S

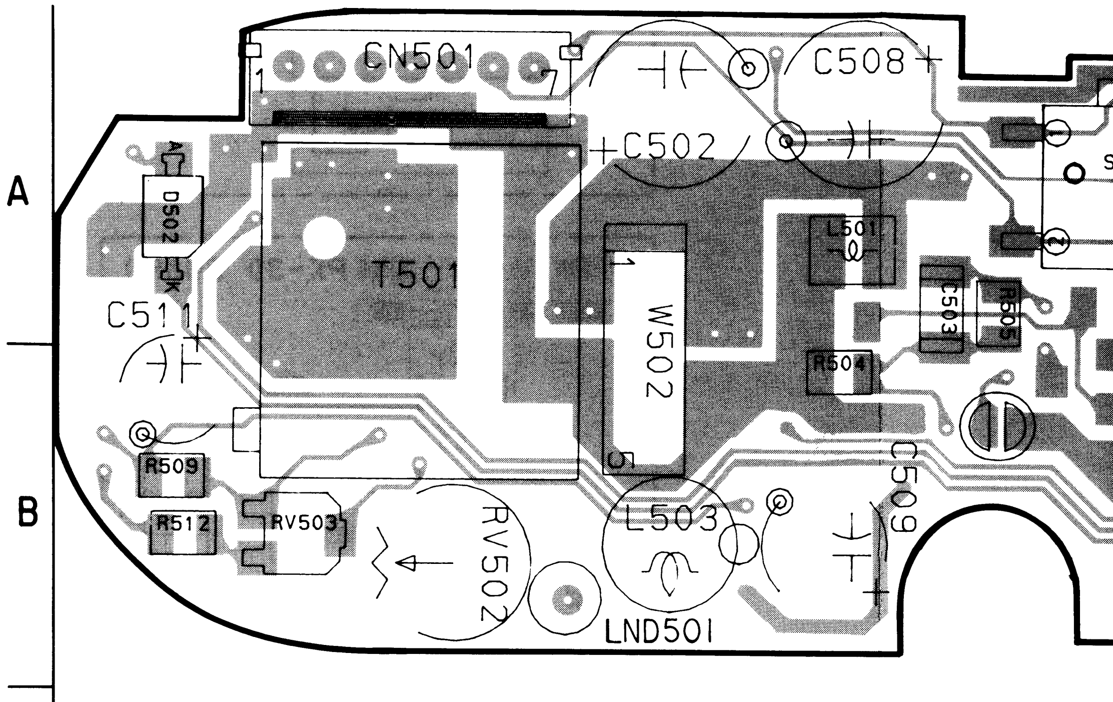
(TRANSISTOR)

Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

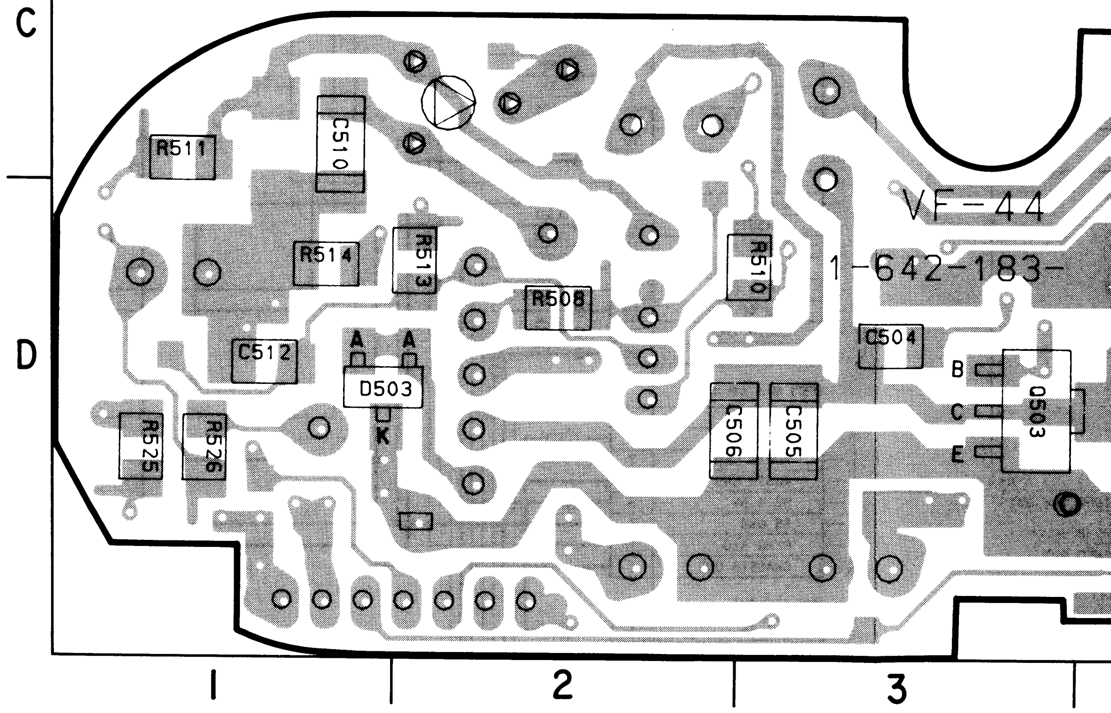
VF-44 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-44 BOARD: 2000 series —

VF-44 (COMPONENT SIDE)


A
B
CN501
1
7
C508
C502
D502
K
T501
W502
1
5
L501
C503
R505
R504
C511
R509
R512
RV503
RV502
L503
LND501
C509

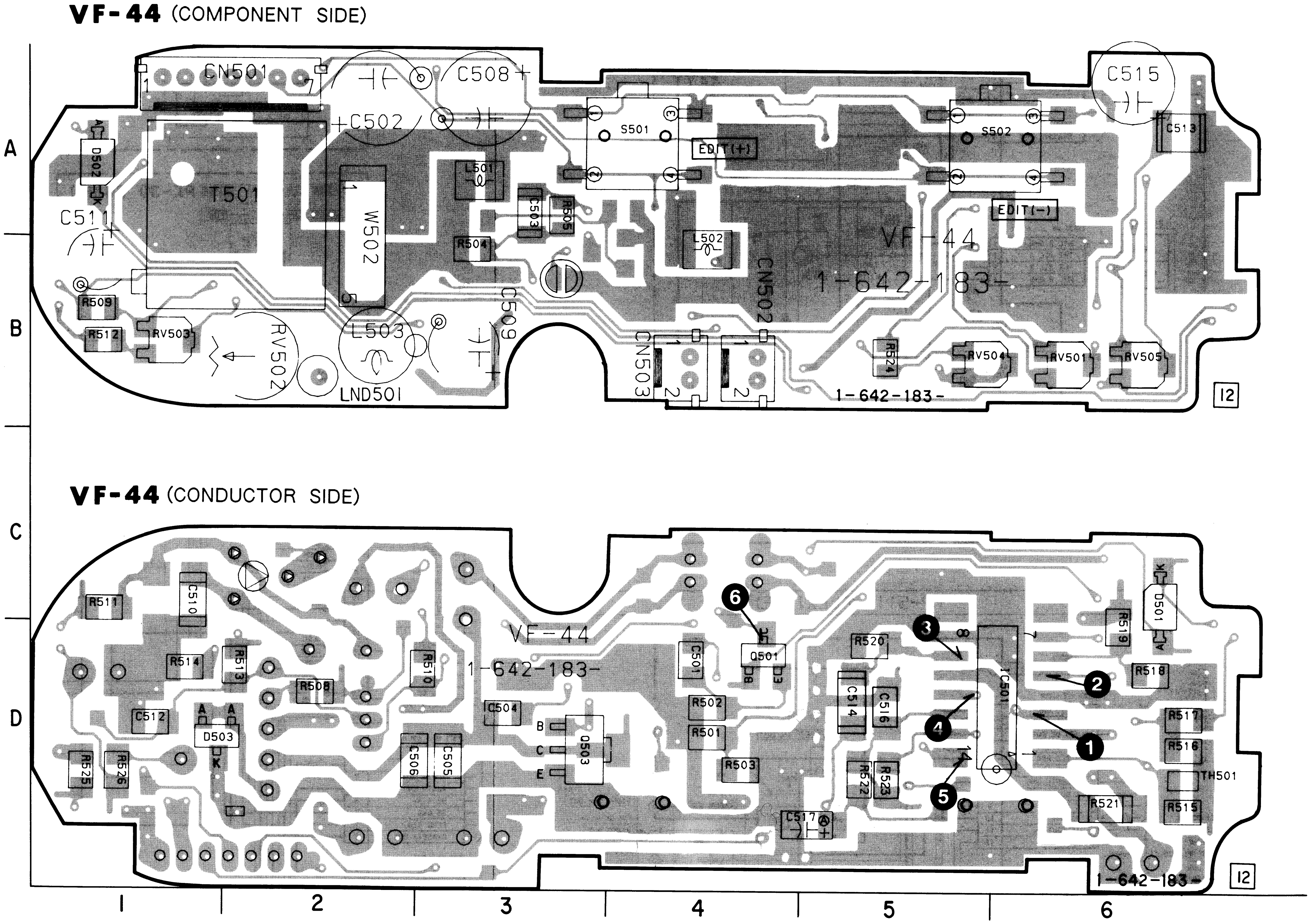
VF-44 (CONDUCTOR SIDE)


C
D
R511
C510
VF-44
1-642-183-
R514
R513
R508
R510
C504
C512
A
A
D503
K
B
C
E
Q503
R525
R526
C506
C505
1
2
3

VF-44 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-44 BOARD: 2000 series —

		⟨ DIODE ⟩	
D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA
		⟨ IC ⟩	
IC501	8-759-420-01	IC	AN2512S
		⟨ TRANSISTOR ⟩	
Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

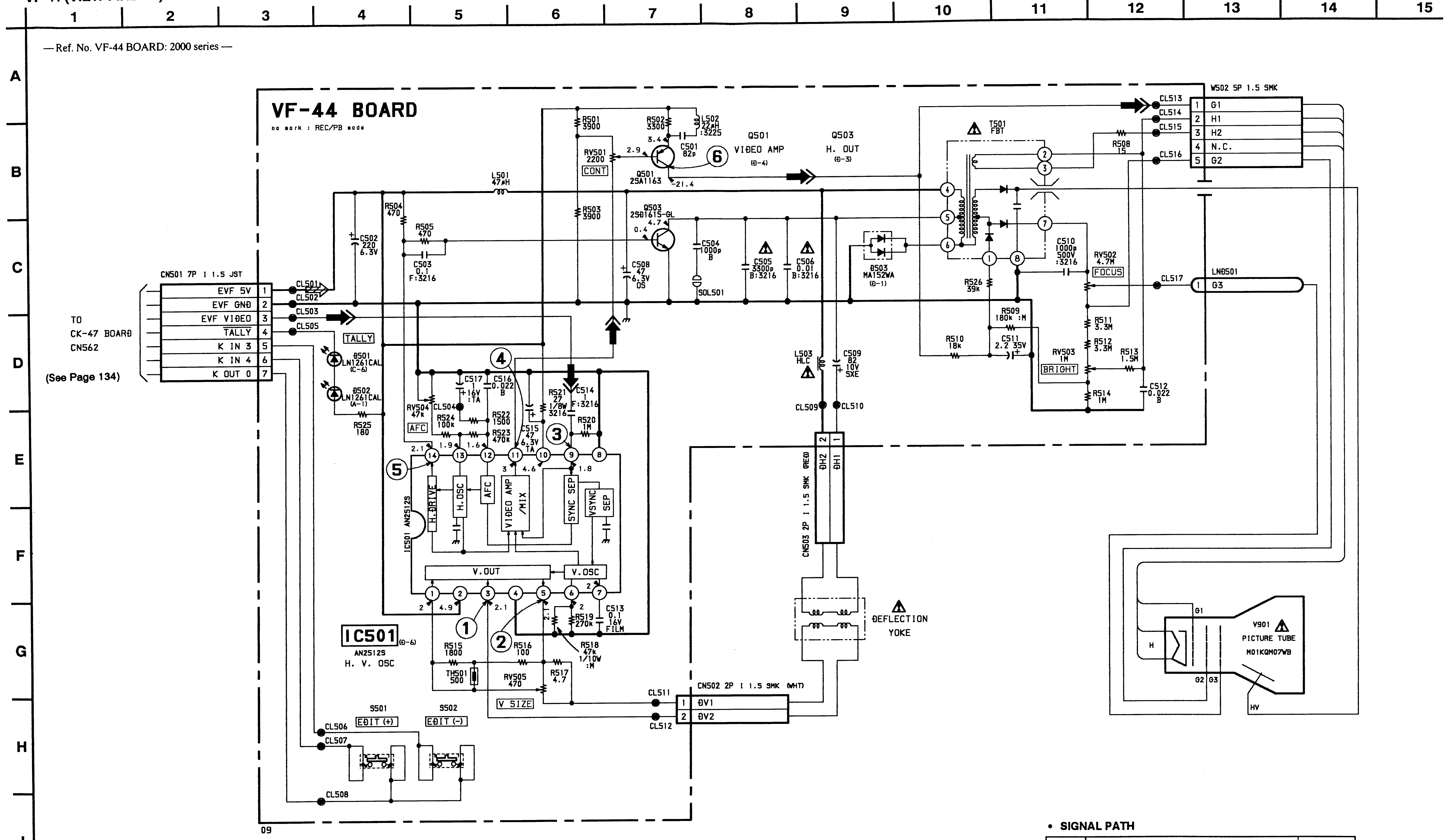

VF-44 (COMPONENT SIDE)

VF-44 (CONDUCTOR SIDE)

A
B
C
D
1
2
3
4
5
6
CN501
C508
C502
C515
C513
S501
S502
EDIT(+)
EDIT(−)
D502
T501
W502
L501
C503
R505
R504
L502
C511
CN502
C509
R509
R512
RV503
RV502
L503
LND501
CN503
VF-44
1-642-183-
R524
RV504
RV501
RV505
12
R511
C510
R514
R513
R508
R510
C501
Q501
R520
R519
D501
R518
C504
C512
D503
A
K
C506
C505
Q503
B
C
E
R502
R501
R503
C514
C516
IC501
R517
R516
TH501
R525
R526
R523
R522
C517
R521
R515
1
2
3
4
5
6
8
14

VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

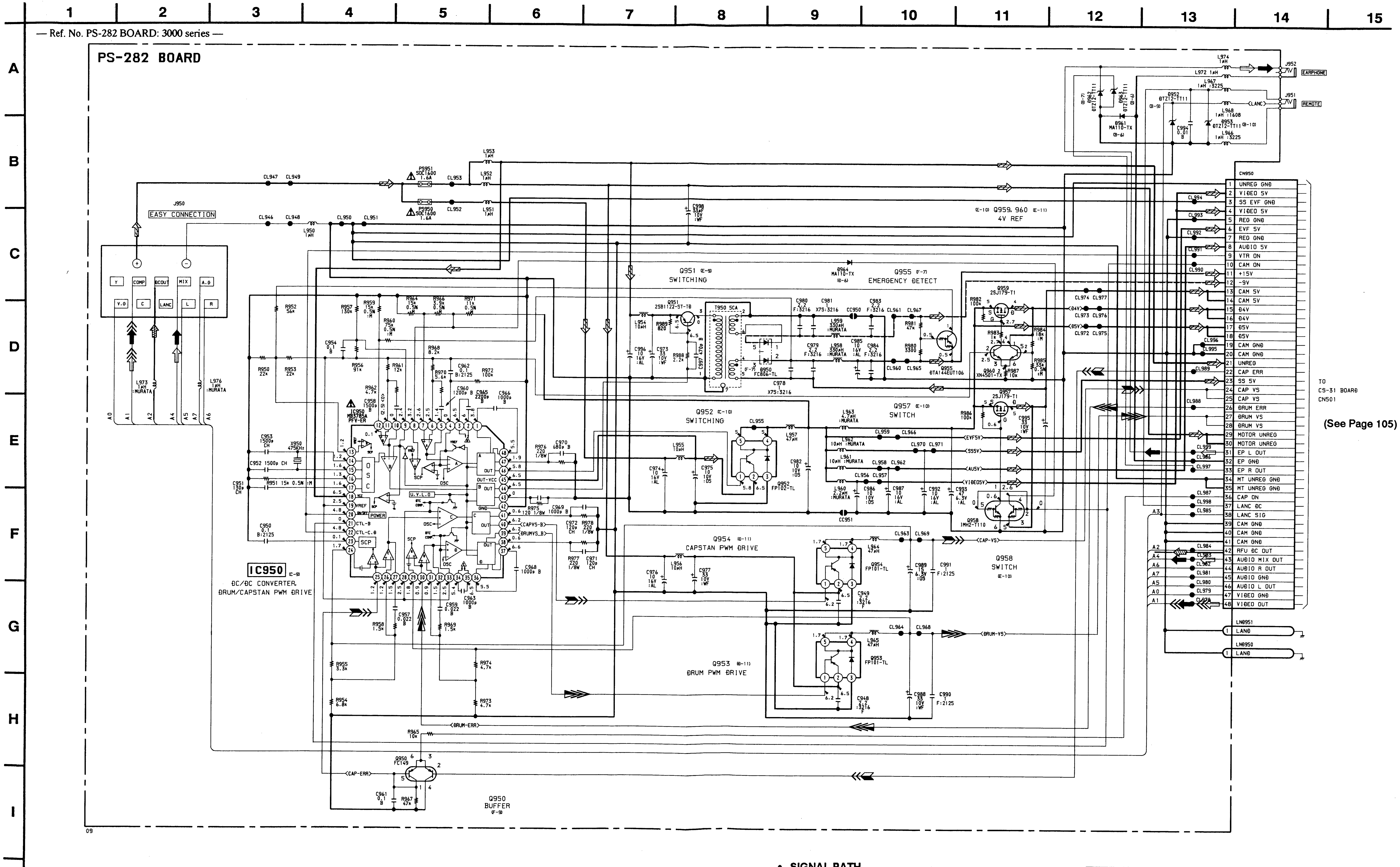
— Ref. No. VF-44 BOARD: 2000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
VF-44 BOARD
no mark : REC/PB mode
CN501 7P 1 1.5 JST
EVF 5V
EVF GND
EVF VIDEO
TALLY
K IN 3
K IN 4
K OUT 0
TO
CK-47 BOARD
CN562
(See Page 134)
CL501
CL502
CL503
CL505
TALLY
D501
LN1261CAL
D502
LN1261CAL
R525
180
C502
220
6.3V
R504
470
R505
470
C503
0.1
F:3216
L501
47μH
R501
3900
R502
3300
L502
22μH
:3225
C501
82p
RV501
2200
CONT
Q501
2SA1163
R503
3900
Q503
2SD1615-GL
C508
47
6.3V
OS
C504
1000p
B
SOL501
C505
3300p
B:3216
C506
0.01
B:3216
Q501
VIDEO AMP
Q503
H. OUT
D503
MA152WA
T501
FBT
R508
15
R526
39k
C510
1000p
500V
:3216
RV502
4.7M
FOCUS
R509
180k :M
R510
18k
C511
2.2 35V
RV503
1M
BRIGHT
R511
3.3M
R512
3.3M
R513
1.5M
C512
0.022
B
R514
1M
CL513
CL514
CL515
CL516
CL517
W502 5P 1.5 SMK
G1
H1
H2
N.C.
G2
LND501
G3
L503
HLC
C509
82
10V
SXE
CL509
CL510
CN503 2P 1 1.5 SMK (RED)
DH2
DH1
DEFLECTION
YOKE
V901
PICTURE TUBE
M01KQM07WB
H
G1
G2
G3
HV
RV504
47k
AFC
CL504
C517
1
16V
:TA
C516
0.022
B
R524
100k
R522
1500
R523
470k
C515
47
6.3V
TA
R521
27
1/8W
3216
C514
1
F:3216
R520
1M
IC501 AN2512S
H.DRIVE
H.OSC
AFC
VIDEO AMP
/MIX
SYNC SEP
VSYNC
SEP
V.OUT
V.OSC
IC501
AN2512S
H. V. OSC
R515
1800
TH501
500
R516
100
RV505
470
V SIZE
R517
4.7
R518
47k
1/10W
:M
R519
270k
C513
0.1
16V
FILM
CL511
CL512
CN502 2P 1 1.5 SMK (WHT)
DV1
DV2
S501
EDIT (+)
S502
EDIT (−)
CL506
CL507
CL508
09
①
②
③
④
⑤
⑥

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		⇒		
PB				

PS-282 (POWER REG) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
— Ref. No. PS-282 BOARD: 3000 series —
PS-282 BOARD
J950
EASY CONNECTION
IC950
DC/DC CONVERTER,
DRUM/CAPSTAN PWM DRIVE
MB3785A
Q951 SWITCHING
Q955 EMERGENCY DETECT
Q959, 960 4V REF
Q952 SWITCHING
Q957 SWITCH
Q954 CAPSTAN PWM DRIVE
Q953 DRUM PWM DRIVE
Q958 SWITCH
Q950 BUFFER
T950 SCA
PS951 SOC1600 1.6A
PS950 SOC1600 1.6A
J952 EARPHONE
J951 REMOTE
CN950
1 UNREG GND
2 VIDEO 5V
3 SS EVF GND
4 VIDEO 5V
5 REG GND
6 EVF 5V
7 REG GND
8 AUDIO 5V
9 VTR ON
10 CAM ON
11 +15V
12 -9V
13 CAM 5V
14 CAM 5V
15 D4V
16 D4V
17 D5V
18 D5V
19 CAM GND
20 CAM GND
21 UNREG
22 CAP ERR
23 SS 5V
24 CAP VS
25 CAP VS
26 DRUM ERR
27 DRUM VS
28 DRUM VS
29 MOTOR UNREG
30 MOTOR UNREG
31 EP L OUT
32 EP GND
33 EP R OUT
34 MT UNREG GND
35 MT UNREG GND
36 CAP ON
37 LANC DC
38 LANC SIG
39 CAM GND
40 CAM GND
41 CAM GND
42 RFU DC OUT
43 AUDIO MIX OUT
44 AUDIO R OUT
45 AUDIO GND
46 AUDIO L OUT
47 VIDEO GND
48 VIDEO OUT
TO CS-31 BOARD CN501
(See Page 105)
LN6951 LAND
LN6950 LAND
09

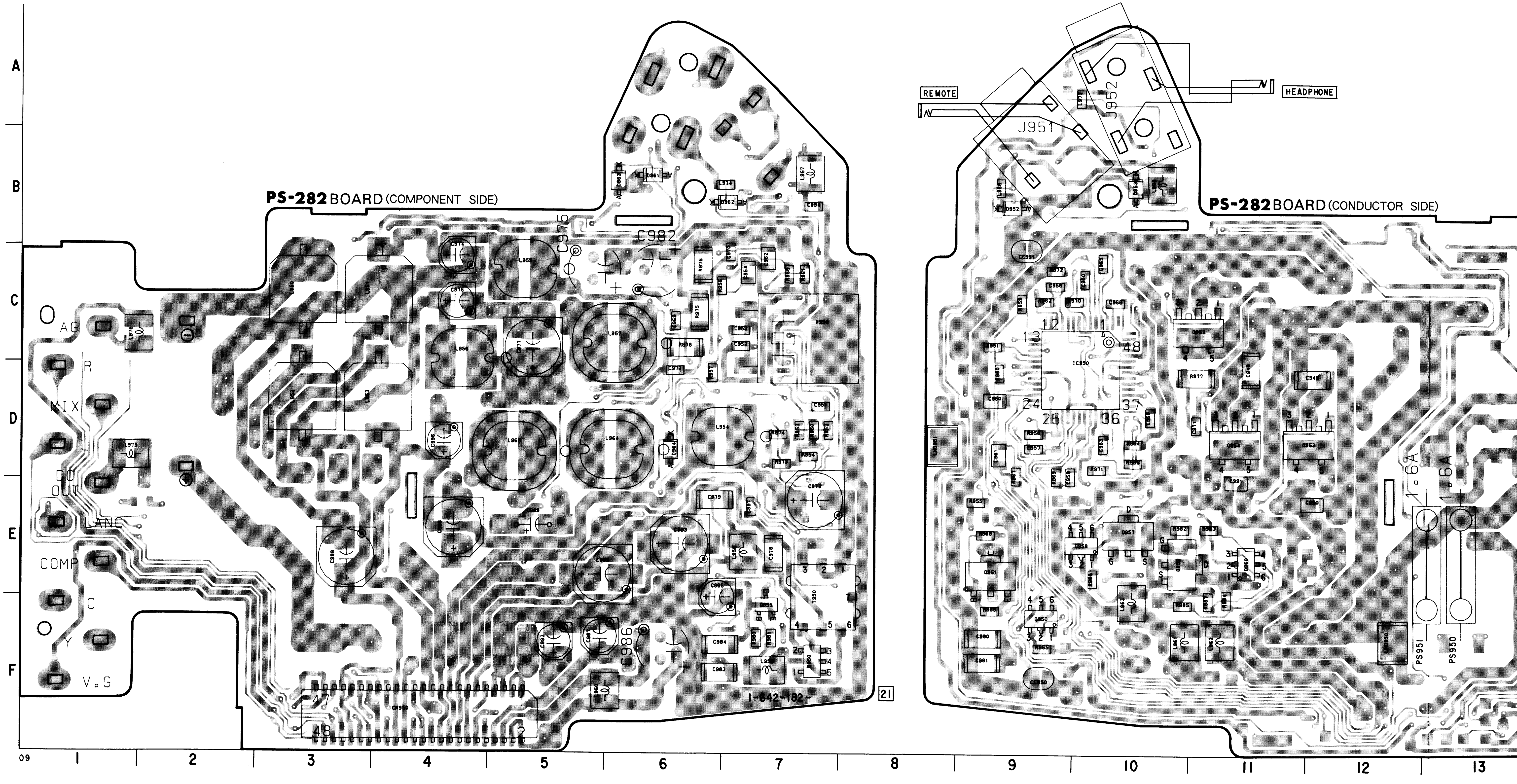
- **SIGNAL PATH**

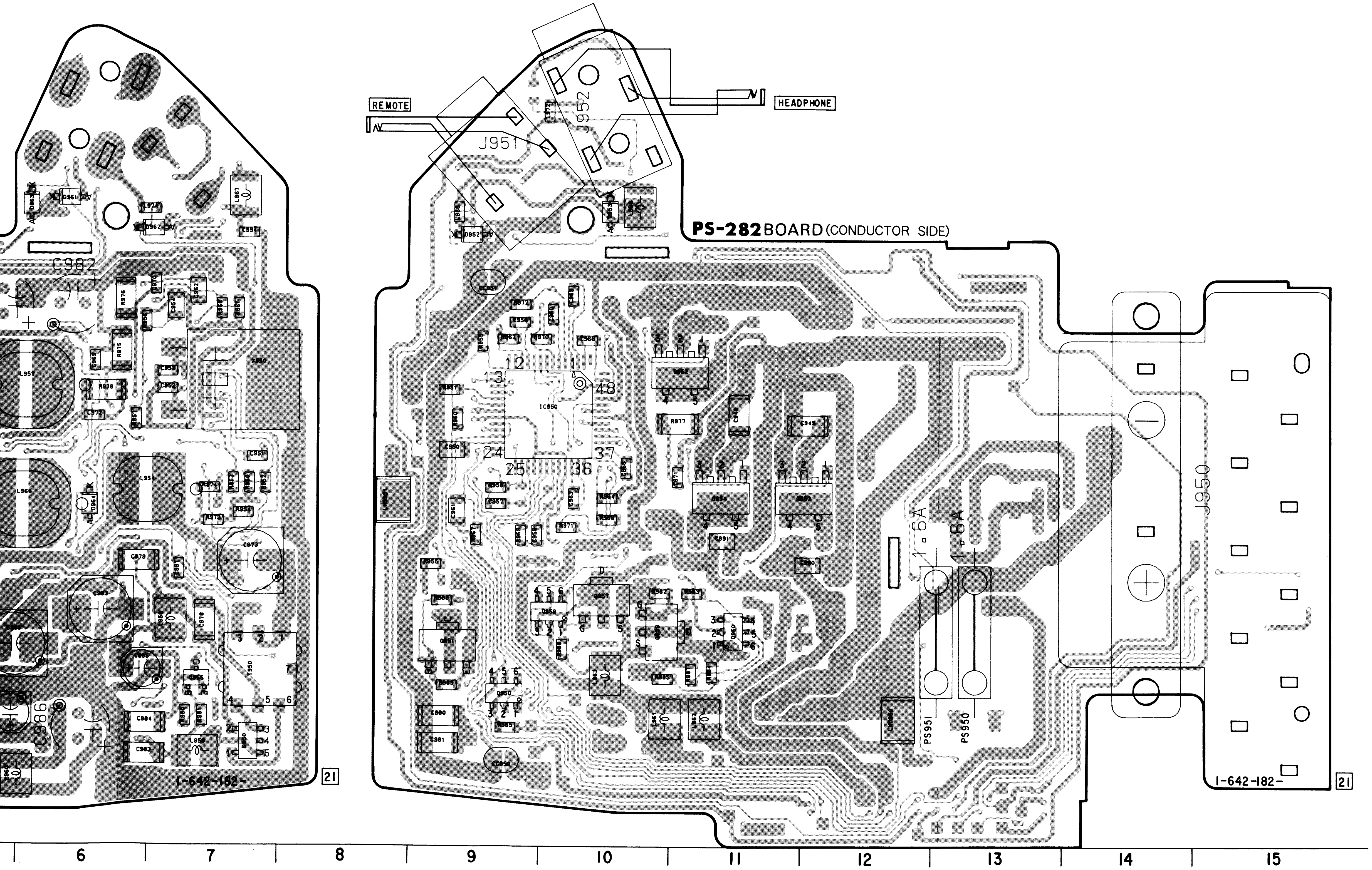
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan phase servo	➤≫	➤≫	▷≫
Capstan servo (speed and phase)		➤≫	

PS-282 (POWER REG) PRINTED WIRING BOARD

— Ref. No. PS-282 BOARD: 3000 series —


PS-282 BOARD (COMPONENT SIDE)
PS-282 BOARD (CONDUCTOR SIDE)
REMOTE
HEADPHONE
J951
J952
AG
R
MIX
DC OUT
LANC
COMP
C
Y
V.G
C975
C982
C986
L955
L956
L957
L964
L965
L954
IC950
T950
CN950
Q951
Q952
Q953
Q954
Q957
Q958
Q959
Q960
PS950
PS951
1.6A
1.6A
1-642-182-
21
12
1
13
48
24
37
25
36
47
48
A
B
C
D
E
F
09
1
2
3
4
5
6
7
8
9
10
11
12
13



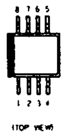
PS-282 BOARD (CONDUCTOR SIDE)

REMOTE
HEADPHONE
J951
J952
J950
IC950
Q950
Q951
Q952
Q953
Q954
Q957
Q958
Q959
Q960
D961
D962
D964
L957
L958
L963
L964
T950
X950
C982
C986
PS951
PS950
1.6A
1.6A
1-642-182-
21
6
7
8
9
10
11
12
13
14
15

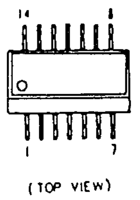
		〈 DIODE 〉	
D950	8-719-989-33	DIODE	FC806
D952	8-719-110-03	DIODE	RD7.5ES-B2
D953	8-719-110-03	DIODE	RD7.5ES-B2
D961	8-719-404-46	DIODE	MA110
D962	8-719-110-03	DIODE	RD7.5ES-B2
D963	8-719-110-03	DIODE	RD7.5ES-B2
D964	8-719-404-46	DIODE	MA110
		〈 IC 〉	
⚠IC950	8-759-060-94	IC	MB3785APFV-G-BND-ER
		〈 TRANSISTOR 〉	
Q950	8-729-823-95	TRANSISTOR	FC149
Q951	8-729-804-41	TRANSISTOR	2SB1122-ST
Q952	8-729-823-84	TRANSISTOR	FP102
Q953	8-729-823-82	TRANSISTOR	FP101
Q954	8-729-823-82	TRANSISTOR	FP101
Q955	8-729-905-12	TRANSISTOR	DTA144EU
Q957	8-729-011-26	TRANSISTOR	2SJ179
Q958	8-729-920-48	TRANSISTOR	IMH2
Q959	8-729-011-26	TRANSISTOR	2SJ179
Q960	8-729-402-81	TRANSISTOR	XN4501

4-3. SEMICONDUCTORS

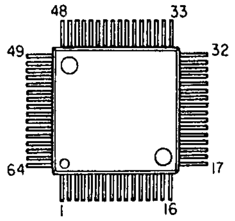
AK6420F
LM358D


8 7 6 5
1 2 3 4
(TOP VIEW)

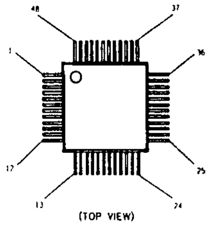
AN2512S


14
8
1
7
(TOP VIEW)

CXA1207AR
CXD1257R


48
33
49
32
64
17
1
16

CXA1208R
CXA-1488R
CXA1507BR
TB1206F-EL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(TOP VIEW)

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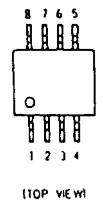
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(TOP VIEW)

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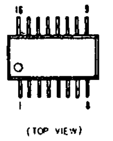
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(TOP VIEW)

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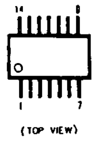
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(TOP VIEW)

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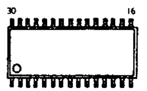
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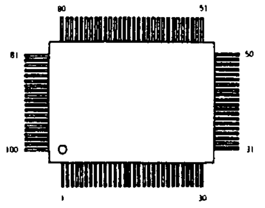
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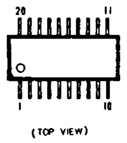
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(TOP VIEW)

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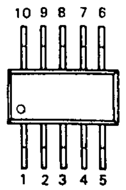
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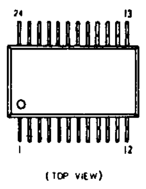
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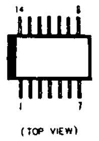
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(TOP VIEW)

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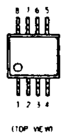
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(TOP VIEW)

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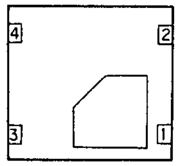

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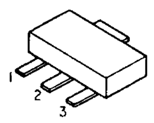

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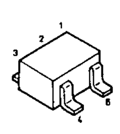

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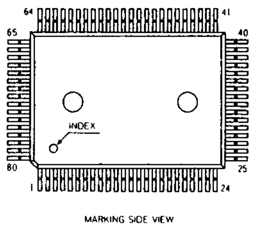
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INDEX
MARKING SIDE VIEW

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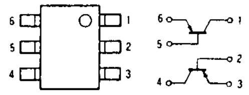

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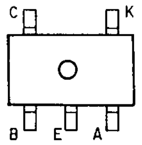
FP102



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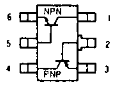
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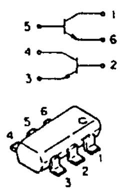
XN4501



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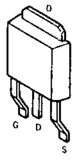

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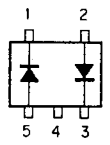

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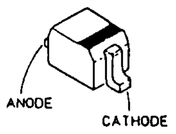
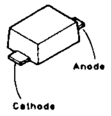
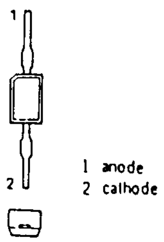

ANODE
CATHODE

MA728


Anode
Cathode

LN1261CAL


1
2
1 anode
2 cathode

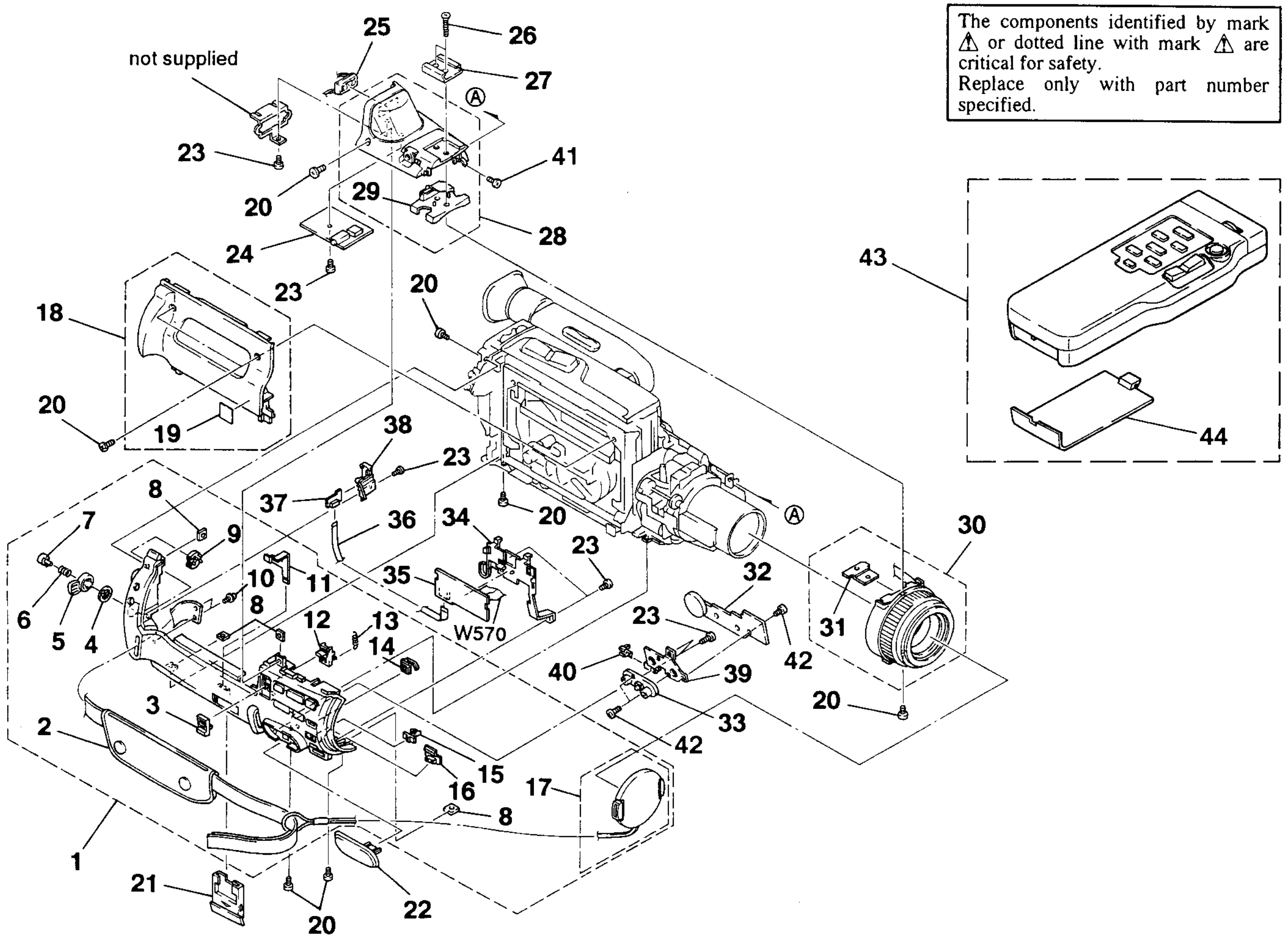
SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (UPPER), (L) ASSEMBLIES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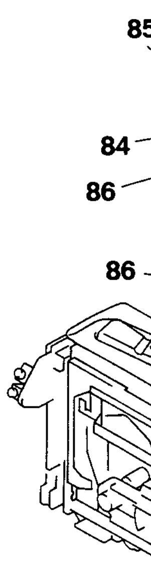
Ref. No.	Part No.	Description	Remark
1	X-3941-789-1	CABINET (L) ASSY (AEP, UK)	
1	X-3941-955-1	CABINET (L) ASSY (Australian)	
2	3-736-807-01	BELT, GRIP	
3	3-946-195-01	BUTTON, EJECT	
4	3-736-364-01	SPRING	
5	3-942-985-01	KNOB, STAND-BY	
6	3-578-221-00	SPRING, COMPRESSION	
7	3-736-343-01	BUTTON, S/S	
8	3-718-233-01	NUT, PLATE	
9	3-946-260-01	HOLDER, STAND-BY KNOB	
10	3-669-480-21	+ PTPWH 2	
11	1-550-743-11	HOLDER, BATTERY	
12	3-946-194-01	LOCK, EJECT	
13	3-570-896-00	SPRING, TENSION	
14	3-946-193-01	KNOB, REC (Australian)	
15	3-946-187-01	BUTTON, EDIT	
16	3-946-261-01	BUTTON, INPUT OUTPUT (Australian)	
17	A-7091-784-A	CAP BLOCK ASSY, LENS	
18	X-3941-804-1	LID ASSY, CASSETTE	
∗ 19	3-703-713-41	STICKER, SONY SYMBOL (10)	
20	3-719-381-01	SCREW (M2X4)	
21	X-3941-541-1	HOLDER ASSY, LITHIUM	
22	3-946-169-01	LID, JACK	
23	3-948-339-01	SCREW (BTP) (2X5), HEAD	
24	A-7063-246-A	MA-93P BOARD, COMPLETE	
25	1-542-126-41	MICROPHONE UNIT	
26	3-948-809-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3941-321-1	CABINET (UPPER) ASSY	
29	3-946-234-01	PRISM, REMOTE CONTROL	
30	1-241-771-11	RES, VAR (FOCUS RING)	
31	3-946-172-01	SHEET METAL, SHOE	
32	A-7071-634-A	PJ-45P BOARD, COMPLETE (AEP, UK)	
32	A-7071-676-A	PJ-45P BOARD, COMPLETE (Australian)	
33	1-537-402-11	TERMINAL BOARD	
34	3-946-259-01	HOLDER, VK	
35	A-7071-632-A	VK-22P BOARD, COMPLETE (AEP, UK)	
35	A-7071-677-A	VK-22P BOARD, COMPLETE (Australian)	
36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
37	A-7071-633-A	SW-200P BOARD, COMPLETE	
38	3-946-185-01	HOLDER, SW	
∗ 39	3-946-225-01	REINFORCEMENT, PJ	
40	3-947-487-01	PLATE, GROUND, PJ	
41	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
42	3-724-455-01	SCREW (M2X4)	
∗ 43	1-693-017-11	REMOTE COMMANDER (CAM CODER) (RMT-509)	
44	3-947-500-01	LID, BATTERY CASE	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	

5-2. CAB



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55	A-706
56	3-946
⚠57	1-451
58	X-394
59	3-946
60	3-713
61	3-740
62	A-708
63	3-946
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∗ 65	3-949
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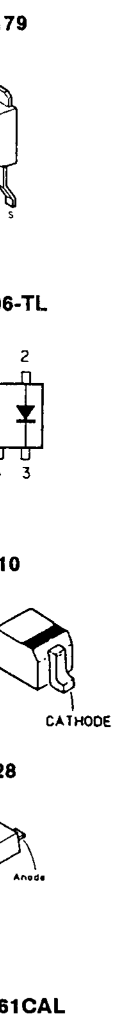


1 anode
2 cathode

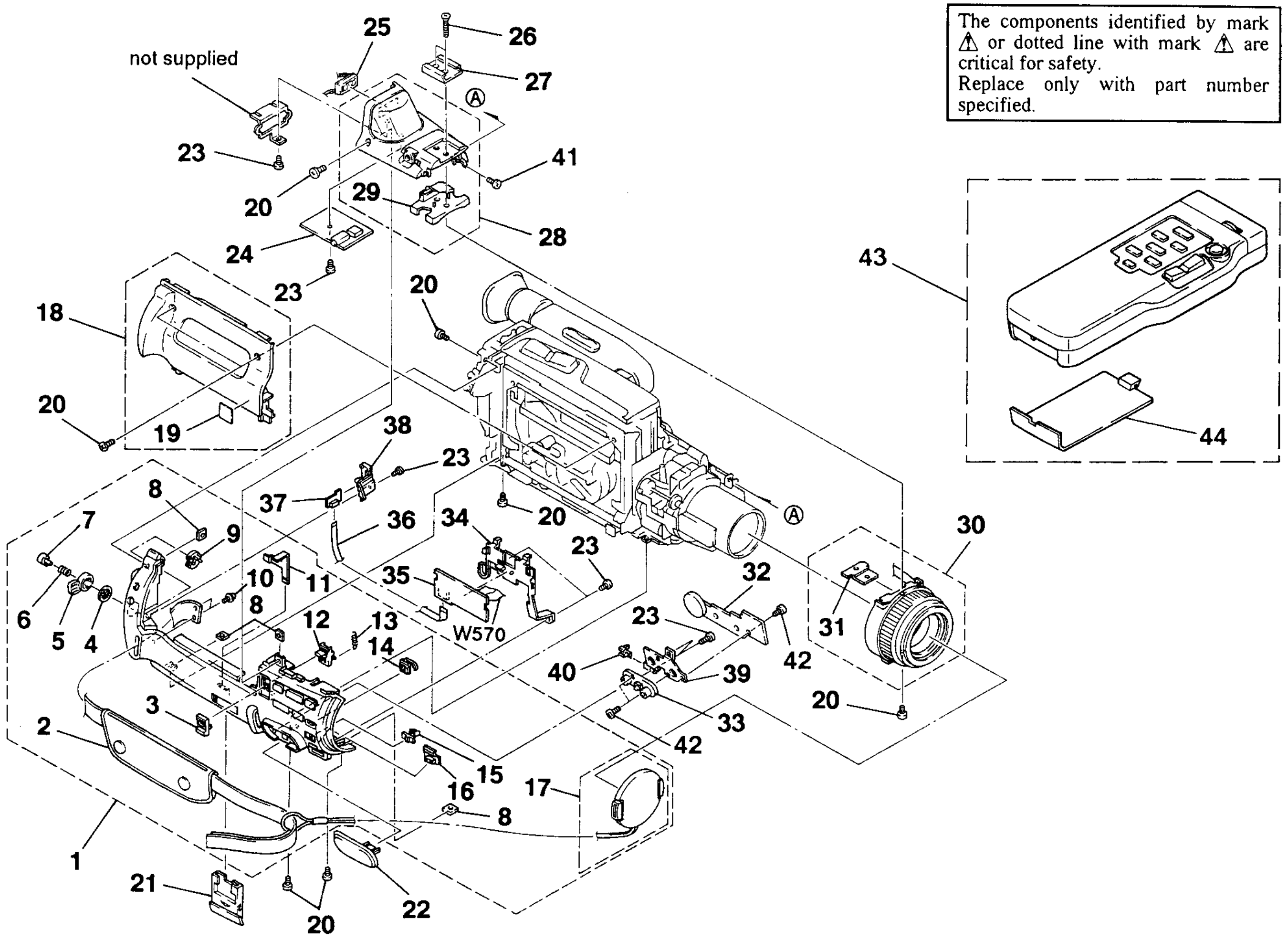
SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

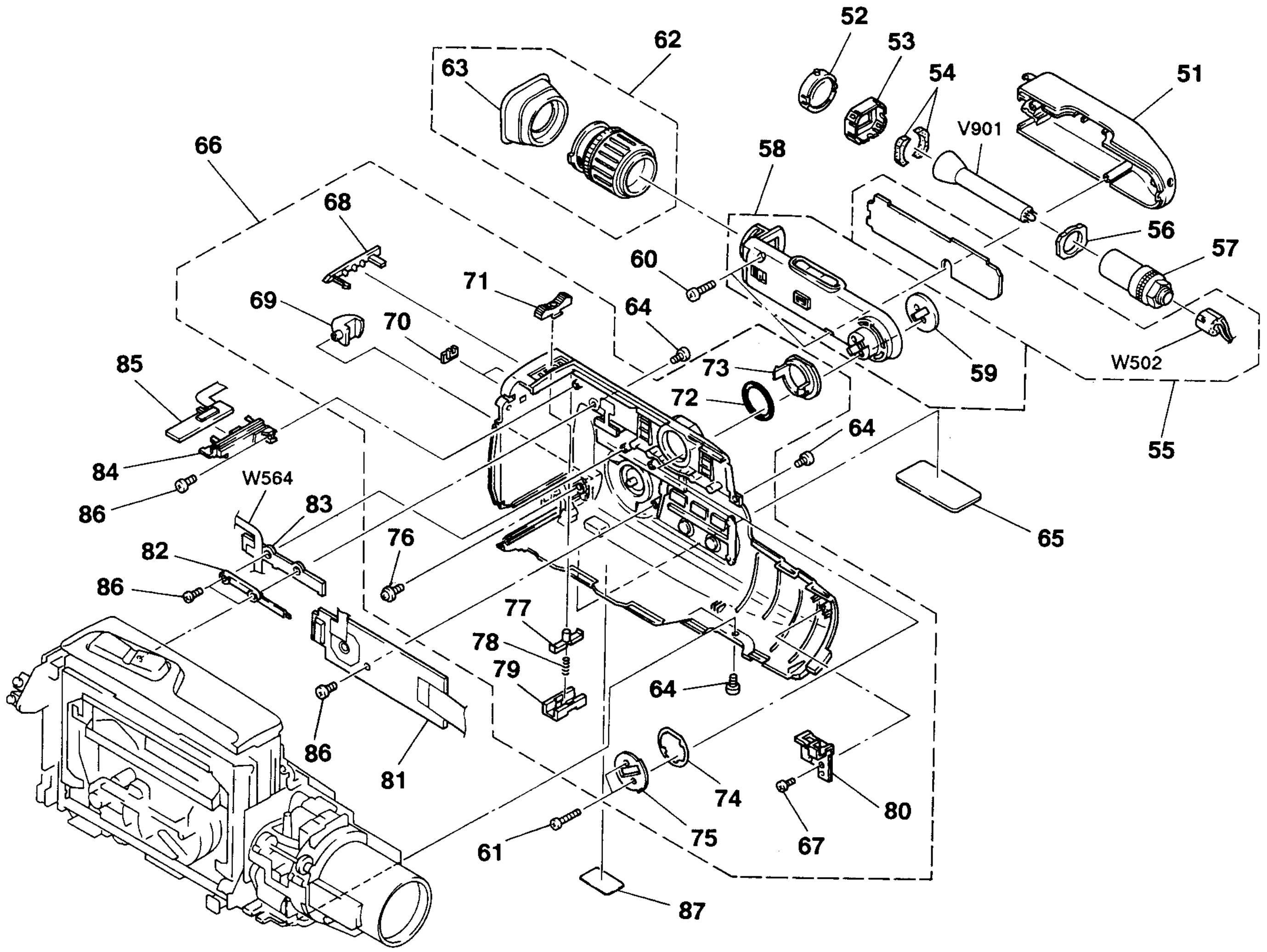
5-1. CABINET (UPPER), (L) ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3941-789-1	CABINET (L) ASSY (AEP, UK)	
1	X-3941-955-1	CABINET (L) ASSY (Australian)	
2	3-736-807-01	BELT, GRIP	
3	3-946-195-01	BUTTON, EJECT	
4	3-736-364-01	SPRING	
5	3-942-985-01	KNOB, STAND-BY	
6	3-578-221-00	SPRING, COMPRESSION	
7	3-736-343-01	BUTTON, S/S	
8	3-718-233-01	NUT, PLATE	
9	3-946-260-01	HOLDER, STAND-BY KNOB	
10	3-669-480-21	+ PTPWH 2	
11	1-550-743-11	HOLDER, BATTERY	
12	3-946-194-01	LOCK, EJECT	
13	3-570-896-00	SPRING, TENSION	
14	3-946-193-01	KNOB, REC (Australian)	
15	3-946-187-01	BUTTON, EDIT	
16	3-946-261-01	BUTTON, INPUT OUTPUT (Australian)	
17	A-7091-784-A	CAP BLOCK ASSY, LENS	
18	X-3941-804-1	LID ASSY, CASSETTE	
* 19	3-703-713-41	STICKER, SONY SYMBOL (10)	
20	3-719-381-01	SCREW (M2X4)	
21	X-3941-541-1	HOLDER ASSY, LITHIUM	
22	3-946-169-01	LID, JACK	
23	3-948-339-01	SCREW (BTP) (2X5), HEAD	
24	A-7063-246-A	MA-93P BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
25	1-542-126-41	MICROPHONE UNIT	
26	3-948-809-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3941-321-1	CABINET (UPPER) ASSY	
29	3-946-234-01	PRISM, REMOTE CONTROL	
30	1-241-771-11	RES, VAR (FOCUS RING)	
31	3-946-172-01	SHEET METAL, SHOE	
32	A-7071-634-A	PJ-45P BOARD, COMPLETE (AEP, UK)	
32	A-7071-676-A	PJ-45P BOARD, COMPLETE (Australian)	
33	1-537-402-11	TERMINAL BOARD	
34	3-946-259-01	HOLDER, VK	
35	A-7071-632-A	VK-22P BOARD, COMPLETE (AEP, UK)	
35	A-7071-677-A	VK-22P BOARD, COMPLETE (Australian)	
36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
37	A-7071-633-A	SW-200P BOARD, COMPLETE	
38	3-946-185-01	HOLDER, SW	
* 39	3-946-225-01	REINFORCEMENT, PJ	
40	3-947-487-01	PLATE, GROUND, PJ	
41	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
42	3-724-455-01	SCREW (M2X4)	
* 43	1-693-017-11	REMOTE COMMANDER (CAM CODER) (RMT-509)	
44	3-947-500-01	LID, BATTERY CASE	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	

5-2. CABINET (R), EVF ASSEMBLIES

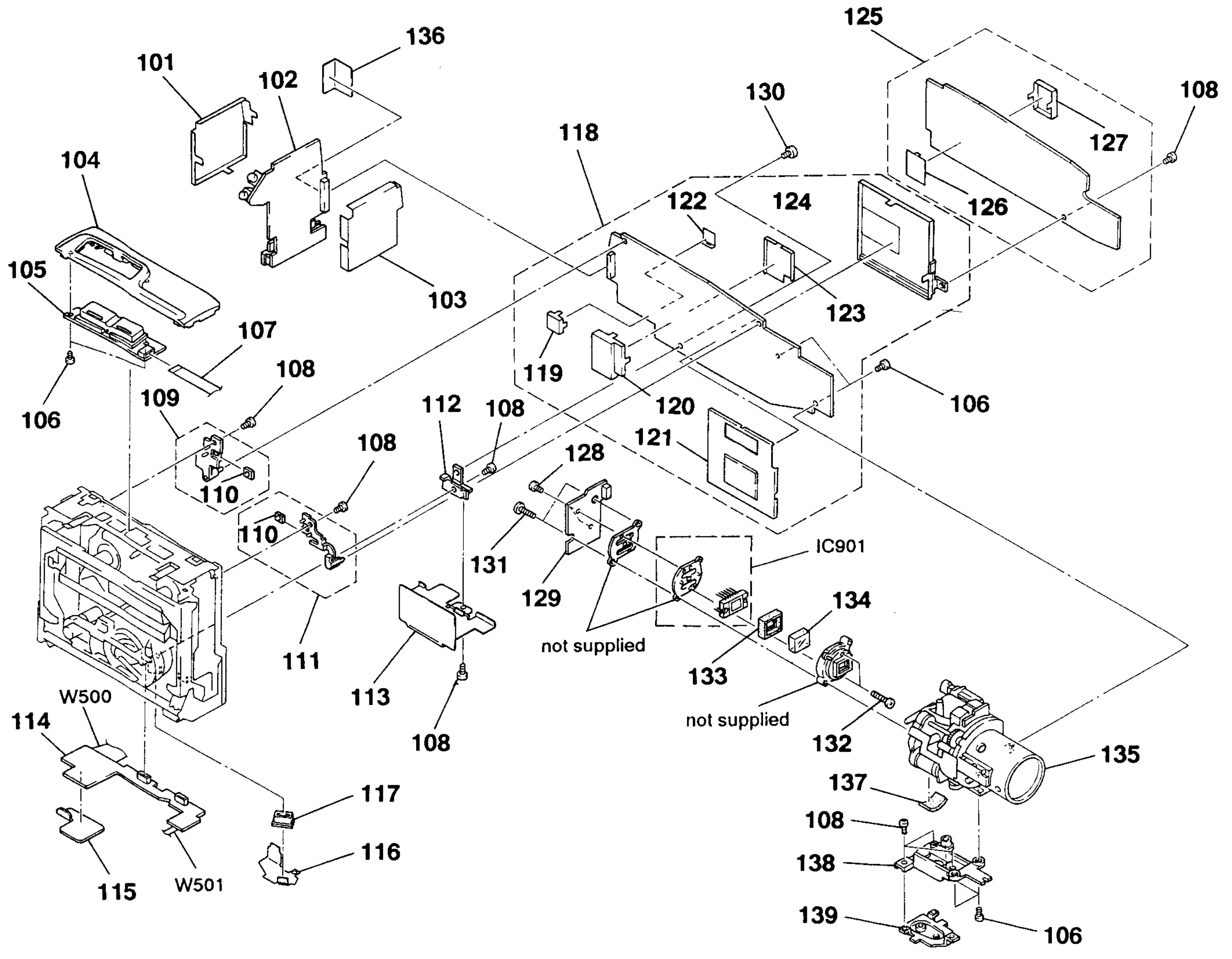


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	X-3941-319-1	CABINET (R) ASSY, EVF	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	A-7063-129-A	VF-44P BOARD, COMPLETE	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	X-3941-318-1	CABINET (L) ASSY, EVF	
59	3-946-202-01	JOINT, EVF	
60	3-713-790-31	SCREW (M2X8), TAPPING, P3	
61	3-740-546-51	SCREW (M2X9)	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-948-532-01	LABEL, MODEL NUMBER (AEP)	
* 65	3-949-285-01	LABEL, MODEL NUMBER (UK, Australian)	
66	X-3941-662-1	CABINET (R) ASSY (Australian)	
66	X-3941-788-1	CABINET (R) ASSY (AEP, UK)	
67	3-713-790-01	SCREW (M2X5), TAPPING, P3	
68	3-946-256-01	CAP, POWER	
69	3-946-246-01	BUTTON, BATTERY RELEASE	

Ref. No.	Part No.	Description	Remark
70	3-946-251-01	BUTTON, ON/OFF	
71	3-946-248-01	BUTTON, POWER	
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	
74	3-946-255-01	SPRING, LEAF, TILT	
75	3-946-254-01	PLATE, LOCK, TILT	
76	3-669-480-21	+ PTPWH 2	
77	3-946-186-01	PUSH BUTTON, POWER	
78	3-303-973-00	SPRING, COMPRESSION	
79	3-946-249-01	PLATE, FUNCTION, POWER	
80	3-947-315-01	PLATE, FIXED, CABINET	
81	A-7071-637-A	CK-47P BOARD, COMPLETE	
82	3-946-199-01	RETAINER, DK	
83	A-7071-638-A	DK-20P BOARD, COMPLETE	
84	3-946-198-01	RETAINER, PK	
85	A-7071-639-A	PK-30P BOARD, COMPLETE	
86	3-948-339-01	SCREW (BTP) (2X5), HEAD	
* 87	3-704-235-01	LABEL, CAUTION (UK)	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
⚠W502	1-526-978-51	SOCKET ASSY, CRT	
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

5-3. MAIN BOARD ASSEMBLY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128
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110
IC901
131
129
134
not supplied
111
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W500
113
not supplied
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W501
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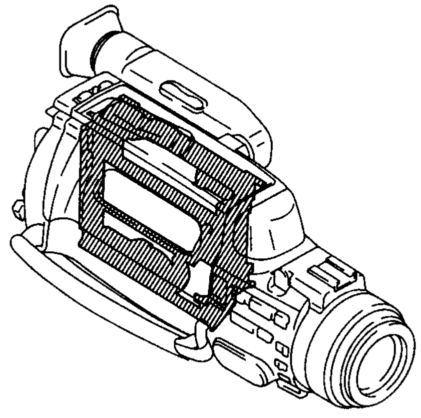
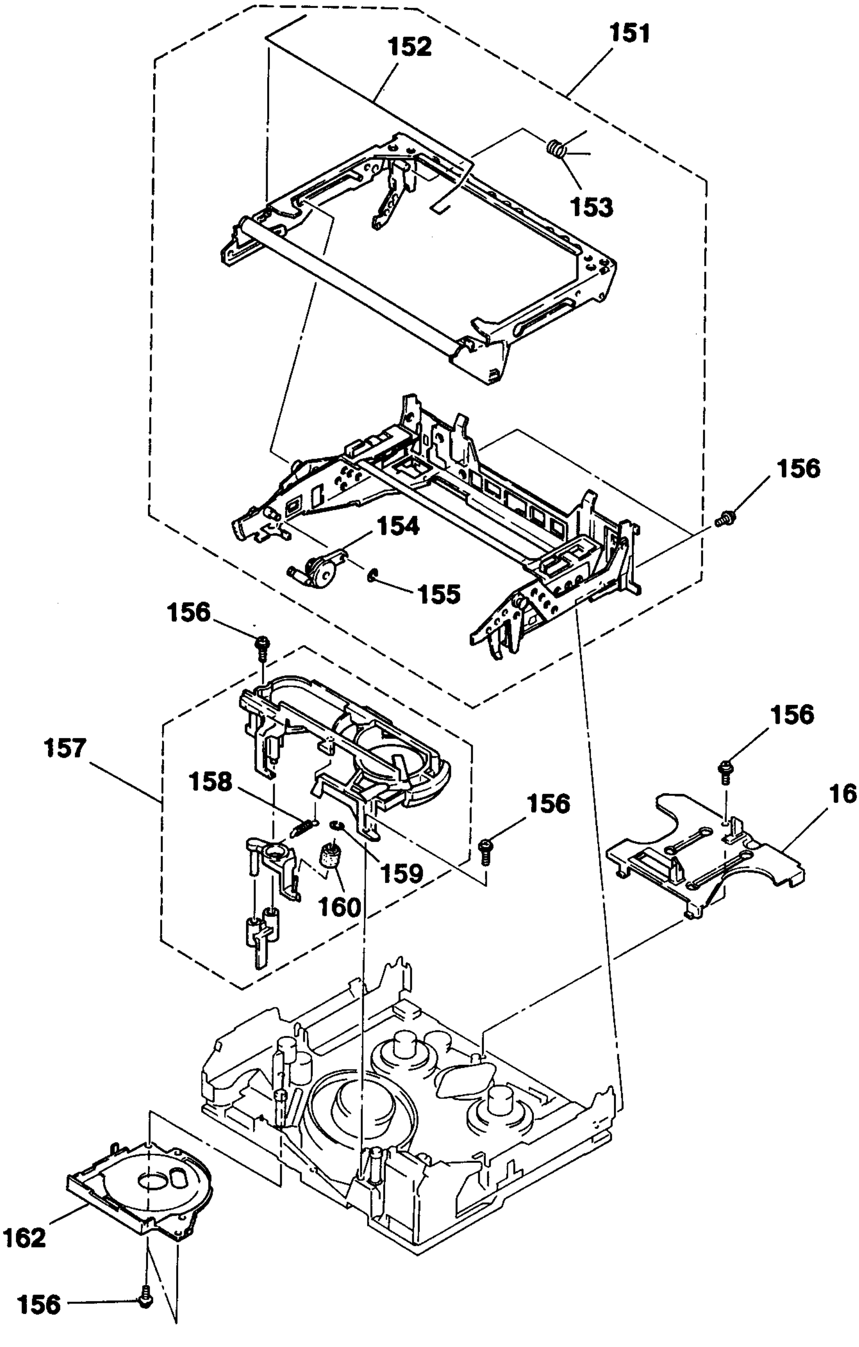
Ref. No.	Part No.	Description	Remark
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-242-A	PS-282P BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-320-1	LID ASSY, LS	
105	1-692-025-11	SWITCH, PUSH	
106	3-948-339-01	SCREW (BTP) (2X5), HEAD	
107	1-643-555-11	FP-558 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
109	A-7081-889-A	HOLDER (R) ASSY, CS	
110	3-718-233-01	NUT, PLATE	
111	A-7081-888-A	HOLDER (F) ASSY, CS	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-245-A	SL-22P BOARD, COMPLETE	
* 115	3-947-660-01	INSULATOR, SL	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-243-A	CS-31P BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-946-177-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 122	3-946-180-01	CASE (LID), SHIELD, FE	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-244-A	VA-71P BOARD, COMPLETE (AEP, UK)	
125	A-7063-295-A	VA-71P BOARD, COMPLETE (Australian)	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-713-786-51	SCREW (M2X3)	
129	A-7063-241-A	CD-61P BOARD, COMPLETE	
130	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
131	3-747-151-21	SCREW (2X12)	
132	3-713-786-11	SCREW (M2X6)	
133	3-943-063-11	RUBBER, SEAL	
134	1-547-558-21	FILTER BLOCK, OPTICAL	
135	1-547-540-11	LENS, ZOOM (VCL-6110WA)(TYPE I)	
135	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
136	3-831-441-XX	CUSHION	
137	3-947-630-01	SHEET, ZOOM RUBBER	
138	3-946-223-01	HOLDER (C), LENS	
139	3-946-224-01	SHEET METAL, TRIPOD	
IC901	A-7030-340-A	CCD ASSY (AUTO)(CCD IMAGER)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT ASSEMBLY

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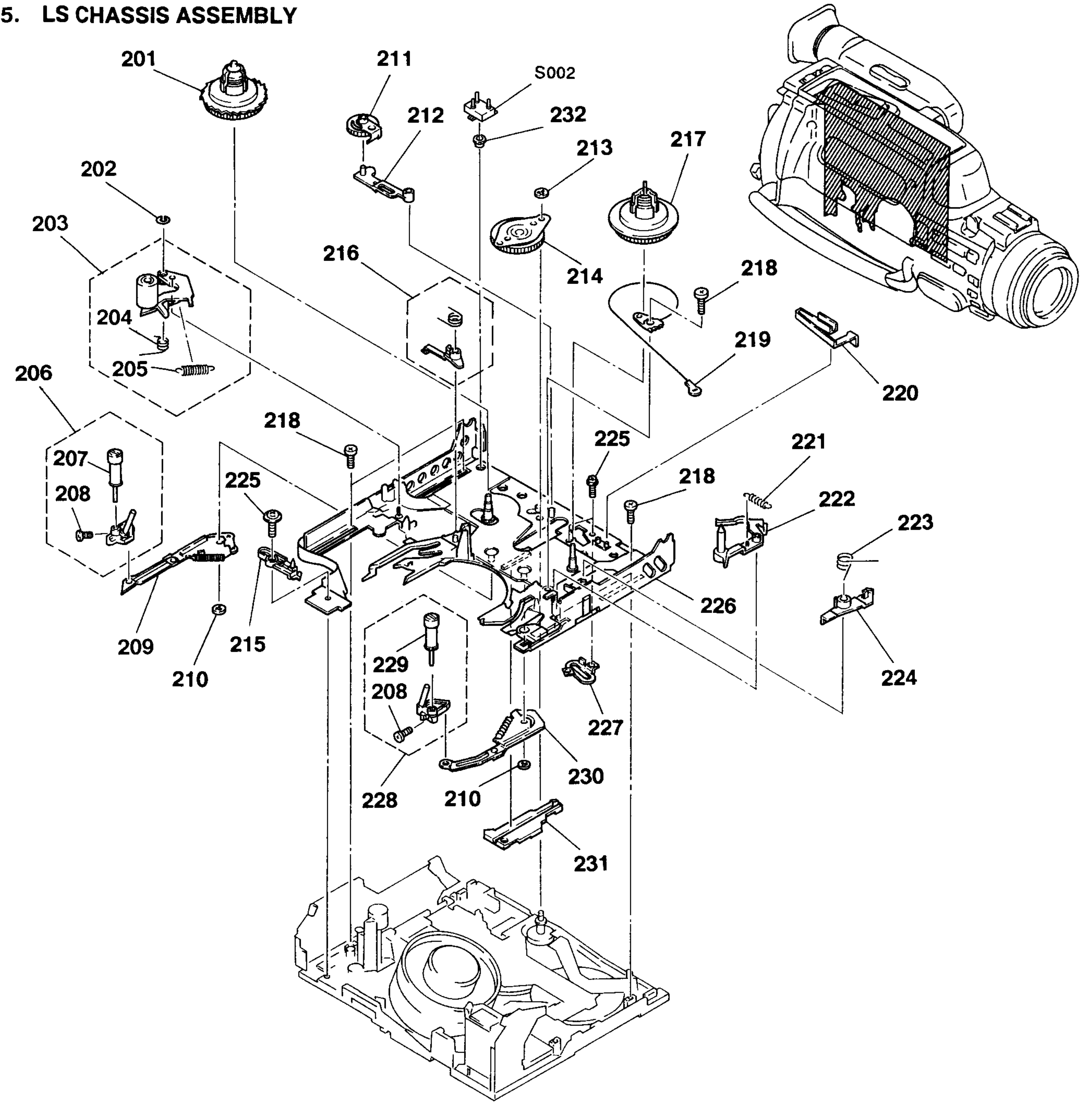
Ref. No.	Part No.	Description	Remark
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-2	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1. 4X2. 5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3726-817-3	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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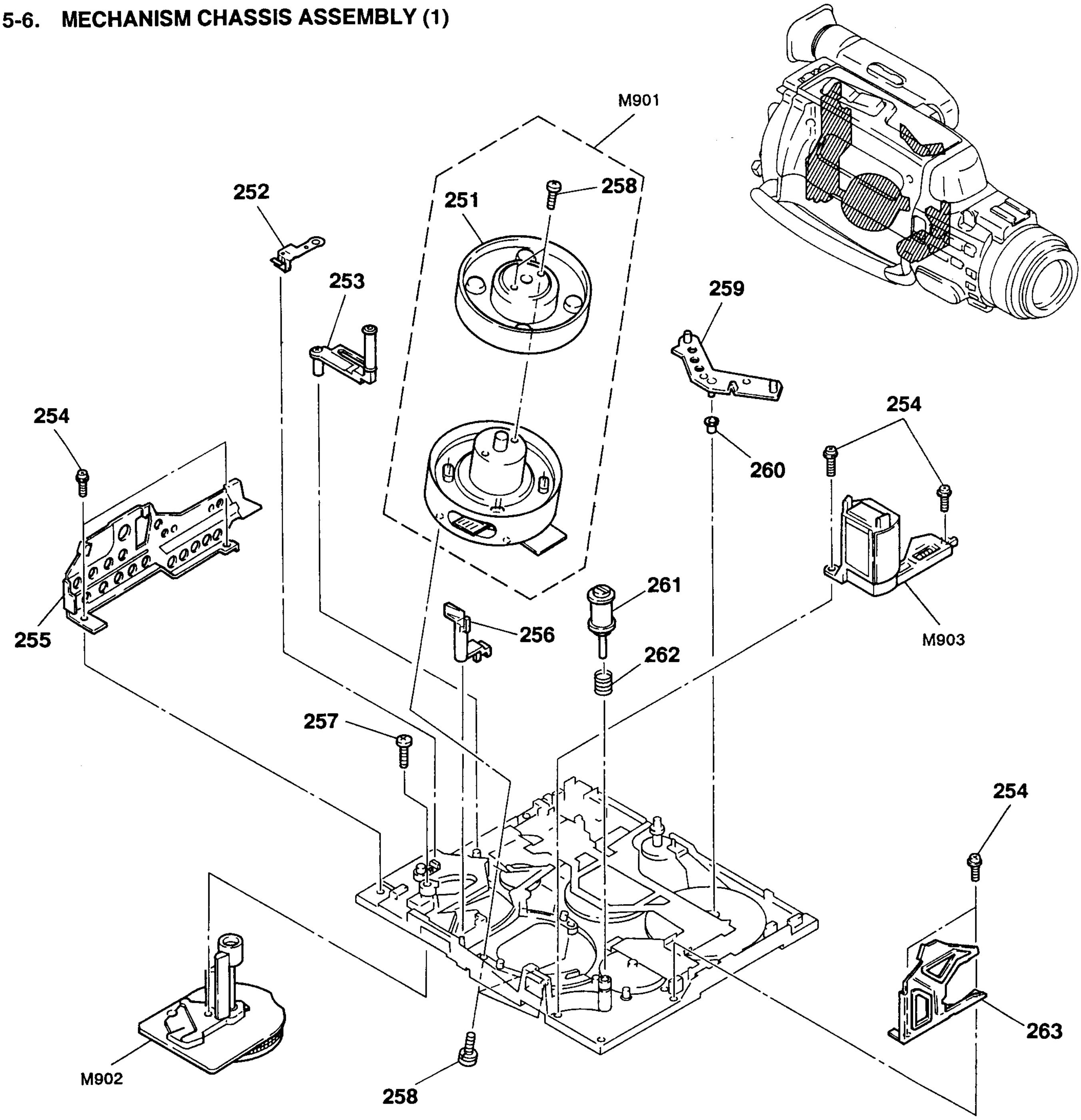
Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-1	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-1	GEAR ASSY, GOOSENECK	
215	3-947-644-01	RETAINER, TG5 (BASE)	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
217	X-3941-275-1	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-948-810-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3942-129-1	ROLLER ASSY (SUS), TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
232	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECHANISM CHASSIS ASSEMBLY (1)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M903
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M902
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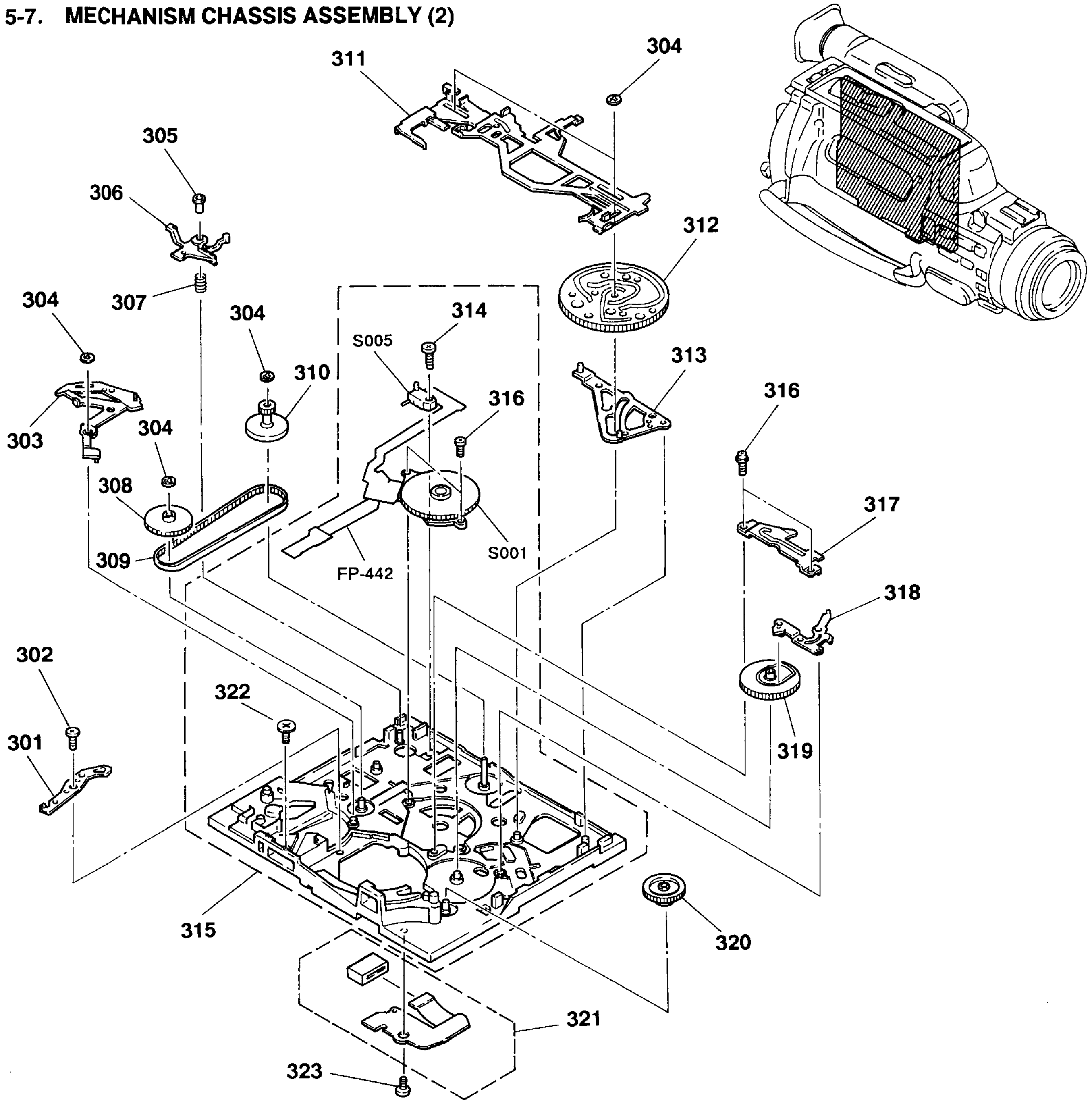
Ref. No.	Part No.	Description	Remark
251	A-7049-521-A	DRUM ASSY, UPPER (DGR-90-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-686-493-01	SCREW (M2X5), P1	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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S005
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FP-442
S001
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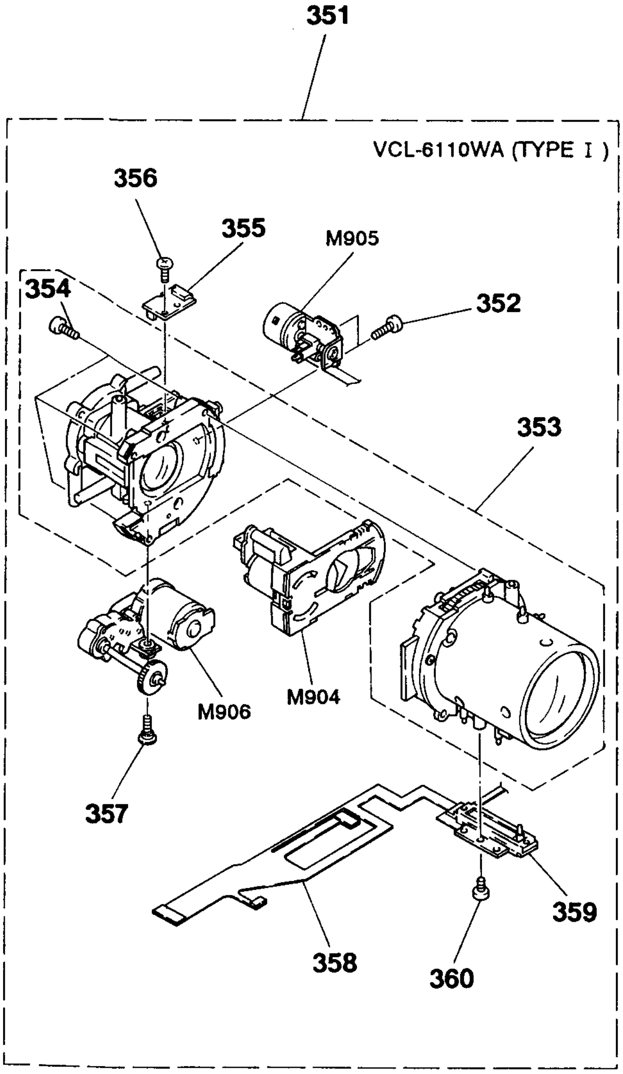
Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-01	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	A-7040-311-A	FP-444 ASSY	
322	3-946-848-01	SCREW, TG6 ADJUSTMENT	
323	3-945-756-01	SCREW (M1.4X3)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-8. ZOOM LENS ASSEMBLY (VCL-6110WA), (VCL-6110WC)

(Distinguishing TYPE I (VCL-6110WA) from TYPE II (VCL-6110WC)
The sensor board attached to the flexible board (Ref. No. 358 or No. 362) or TYPE I (VCL-6110WA) can be removed with a connector (Ref. No. 355) while that of TYPE II (VCL-6110WC) cannot.)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VCL-6110WA (TYPE I)
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M905
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M906
M904
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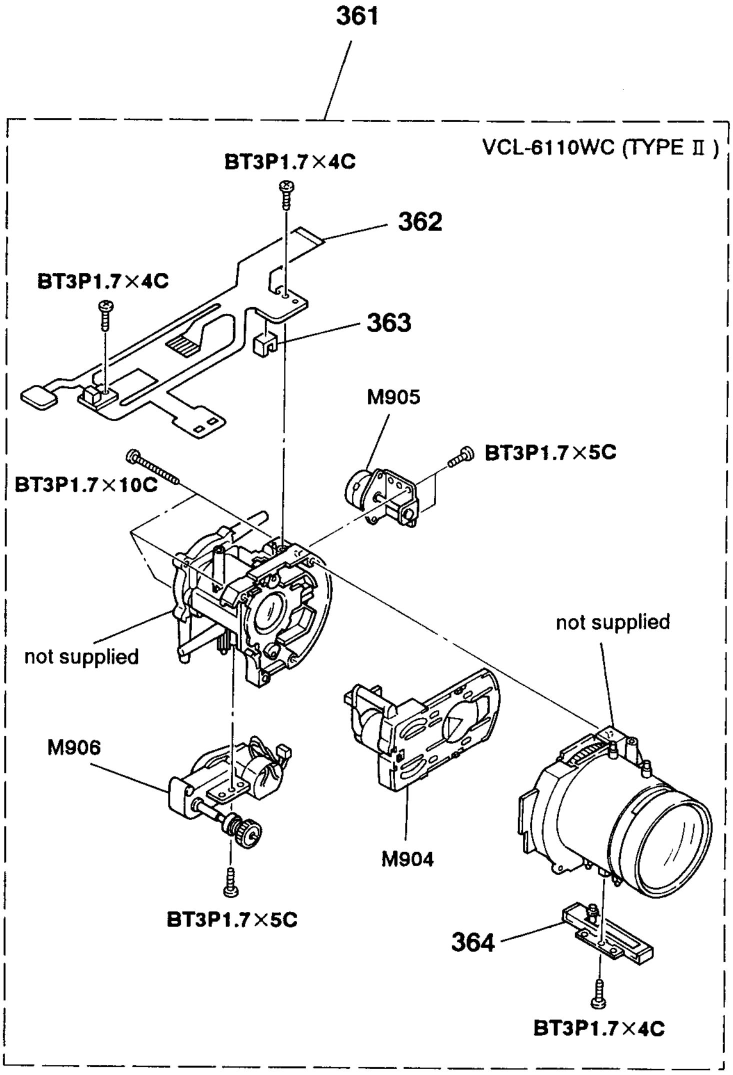
361
BT3P1.7×4C
VCL-6110WC (TYPE II)
362
BT3P1.7×4C
363
M905
BT3P1.7×5C
BT3P1.7×10C
not supplied
not supplied
M906
M904
BT3P1.7×5C
364
BT3P1.7×4C

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
351	1-547-540-11	LENS, ZOOM (VCL-6110WA)(TYPE I)		361	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
352	3-708-390-01	SCREW, FITTING, FOCUS MOTOR (TYPE I)		362	3-708-488-01	P.C.B ASSY, MAIN (TYPE II)	
353	3-708-384-01	LENS ASSY (TYPE I)		363	3-708-490-01	PHOTO INTERRUPTER (FOCUS END)(TYPE II)	
354	3-708-386-01	SCREW, DOCKING (TYPE I)		364	3-708-485-01	ENCORDER, ZOOM (TYPE II)	
355	3-708-331-01	SENSOR ASSY, RESET (TYPE I)		M904	3-708-385-01	IRIS ASSY (TYPE I)	
356	3-708-392-01	SCREW, FITTING, FI BOARD (TYPE I)		M904	3-708-486-01	METER ASSY, IG (IRIS)(TYPE II)	
357	3-707-501-01	SCREW, (Z) MOTOR FITTING (TYPE I)		M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
358	3-708-395-01	CHASSIS, RELAY FLEXIBLE (TYPE I)		M905	3-708-489-01	MOTOR ASSY, AF (FOCUS)(TYPE II)	
359	3-708-393-01	POTENTIAL, ZOOM (FOCUS END)(TYPE I)		M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	
360	3-708-394-01	SCREW, FITTING, ZOOM POTENTIAL (TYPE I)		M906	3-708-487-01	MOTOR ASSY, PZ (ZOOM)(TYPE II)	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
*	A-7063-241-A	CD-61 BOARD, COMPLETE ********************** (Ref, No 1,000 Series)	
		(CAPACITOR)	
C901	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V	
C902	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C903	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C904	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C905	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C906	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C907	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C908	1-128-007-11	ELECT CHIP 2.2uF 20% 35V	
C909	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C911	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		(CONNECTOR)	
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
		(DIODE)	
D901	8-719-820-05	DIODE 1SS181	
D903	8-719-820-05	DIODE 1SS181	
D904	8-719-800-76	DIODE 1SS226	
		(COIL)	
L901	1-412-032-11	INDUCTOR CHIP 100uH	
		(TRANSISTOR)	
Q901	8-729-602-21	TRANSISTOR 2SC4154-F	
Q902	8-729-402-13	TRANSISTOR XN1501	
Q903	8-729-232-86	TRANSISTOR 2SK1875	
		(RESISTOR)	
R901	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R902	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R903	1-216-819-11	METAL CHIP 680 5% 1/16W	
R904	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R905	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R906	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R907	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R908	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R910	1-216-809-11	METAL CHIP 100 5% 1/16W	
R911	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R914	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R915	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R916	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R917	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R918	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
**			
*	A-7071-637-A	CK-47 BOARD, COMPLETE ********************* (Ref, No 6,000 Series)	
		(CAPACITOR)	
C561	1-164-506-11	CERAMIC CHIP 4.7uF 16V	
		(CONNECTOR)	
* CN562	1-580-756-21	PIN, CONNECTOR 7P	
		(DIODE)	
D560	8-719-820-05	DIODE 1SS181	
D561	8-719-404-46	DIODE MA110	
D562	8-719-110-03	DIODE RD7.5ES-B2	
D563	8-719-110-03	DIODE RD7.5ES-B2	
D564	8-719-110-03	DIODE RD7.5ES-B2	
D565	8-719-110-03	DIODE RD7.5ES-B2	
		(COIL)	
L560	1-412-028-11	INDUCTOR CHIP 4.7uH	
		(SWITCH)	
S560	1-692-024-11	SWITCH, ROTARY (PROGRAM AE)	
S564	1-572-938-21	SWITCH, TACTIL (DATE)	
S565	1-572-938-21	SWITCH, TACTIL (TIME)	
S566	1-572-938-21	SWITCH, TACTIL (EVENT)	
S567	1-692-111-11	SWITCH, KEY BOARD (BACK LIGHT)	
S568	1-692-111-11	SWITCH, KEY BOARD (FADER)	
		(FLAT CABLE)	
W561	1-690-602-11	CABLE, FLAT (FFC-23) 16P	

CS-31

Ref. No.	Part No.	Description	Remark
		**	
*	A-7063-243-A	CS-31 BOARD, COMPLETE ********************** (Ref.No 3,000 Series)	
	X-3941-498-1	CASE (LID), SHIELD, CAMERA	
*	3-946-177-01	CASE (MAIN), SHIELD, RP	
*	3-946-178-01	CASE (LID), SHIELD, RP	
*	3-946-179-01	CASE (MAIN), SHIELD, FE	
*	3-946-180-01	CASE (LID), SHIELD, FE	
		‹ CAPACITOR ›	
C001	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C002	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C003	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C004	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C005	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C006	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C007	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C008	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C009	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C010	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C011	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C012	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C013	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C014	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C016	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C017	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C018	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C019	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C020	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C021	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C022	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C023	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C024	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C025	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C026	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C028	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C041	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C042	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C043	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C044	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C045	1-164-217-11	CERAMIC CHIP 150PF 5% 50V	
C046	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C501	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C502	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C503	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C504	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C505	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C506	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C507	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C508	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C509	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C510	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C511	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C512	1-164-173-11	CERAMIC CHIP 0.0039uF 10% 50V	
C513	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C514	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C515	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C517	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C518	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C519	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C520	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C521	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C522	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C523	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C524	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C525	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C526	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C527	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C528	1-128-006-11	ELECT CHIP 4.7uF 20% 25V	
C529	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C530	1-162-918-11	CERAMIC CHIP 18PF 5% 50V	
C531	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C532	1-162-905-11	CERAMIC CHIP 1PF 0.25PF50V	
C534	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C535	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C536	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C538	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C540	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C541	1-126-204-11	ELECT CHIP 47uF 20% 16V	
C542	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C543	1-164-107-11	CERAMIC CHIP 0.15uF 10% 16V	
C544	1-164-107-11	CERAMIC CHIP 0.15uF 10% 16V	
C546	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C547	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C548	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C549	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C550	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C551	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C552	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C553	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C554	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C555	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C556	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C558	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C559	1-126-204-11	ELECT CHIP 47uF 20% 16V	
C560	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C561	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C562	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C563	1-162-971-11	CERAMIC CHIP 0.001uF 50V	

Ref. No.	Part No.	Description				Remark
C564	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C565	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C566	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C567	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C568	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C569	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C570	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C571	1-162-961-11	CERAMIC CHIP	330PF	10%	50V	
C572	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C573	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C574	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C575	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C576	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C577	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C578	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C579	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C580	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C582	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C583	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C584	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C586	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C587	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C588	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C589	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C590	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C591	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C592	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C593	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C594	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C595	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C701	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C702	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C703	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C705	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C706	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C708	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C709	1-164-346-11	CERAMIC CHIP	1uF		16V	
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C711	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C712	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C713	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C714	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C717	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C718	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C721	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C722	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C724	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C725	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	

Ref. No.	Part No.	Description				Remark
C726	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C729	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C731	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C733	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C734	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C736	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C737	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C738	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C739	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C741	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C743	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C745	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C751	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C752	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C754	1-162-943-11	CERAMIC CHIP	15PF	5%	50V	
C756	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C757	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C801	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C802	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C803	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C804	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C807	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C809	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C810	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C811	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C813	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C814	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C815	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C816	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C819	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C826	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C828	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C831	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C832	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C833	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C834	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C835	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C836	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C837	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C838	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	

CS-31

Ref. No.	Part No.	Description	Remark
C839	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C840	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C851	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C852	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C853	1-162-638-11	CERAMIC CHIP 1uF 16V	
C854	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C855	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C856	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C857	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C858	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C859	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C861	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C862	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C863	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C864	1-162-638-11	CERAMIC CHIP 1uF 16V	
C865	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C866	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C868	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C869	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C870	1-164-173-11	CERAMIC CHIP 0.0039uF 10% 50V	
C872	1-162-638-11	CERAMIC CHIP 1uF 16V	
C875	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN001	1-569-775-21	PIN, CONNECTOR 5P	
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P	
CN501	1-691-520-11	CONNECTOR, BOARD TO BOARD 48P	
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P	
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P	
CN504	1-691-524-11	CONNECTOR, BOARD TO BOARD 20P	
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P	
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P	
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P	
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P	
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	

(TRIMMER)

Ref. No.	Part No.	Description	Remark
CT801	1-141-356-11	CAP, ADJ 6PF	

(DIODE)

Ref. No.	Part No.	Description	Remark
⚠D501	8-719-421-27	DIODE MA728	
D502	8-719-404-46	DIODE MA110	
D503	8-719-977-34	DIODE DTZ12	
D504	8-719-941-86	DIODE DAN202U	
D505	8-719-422-07	DIODE MA8082	
D506	8-719-422-07	DIODE MA8082	
D507	8-719-404-46	DIODE MA110	

(FILTER)

Ref. No.	Part No.	Description	Remark
FL701	1-402-713-21	COIL, OSC (PAL)	

(IC)

Ref. No.	Part No.	Description	Remark
IC001	8-752-058-14	IC CXA1202R	
IC501	8-759-058-96	IC TB1206F	
IC502	8-759-999-02	IC TL1596CDB	
IC503	8-752-838-46	IC CXP80624-410Q	
IC505	8-759-990-55	IC CXA8006M	
IC506	8-759-088-92	IC uPD75316GF-303-3B9	
IC507	8-759-511-22	IC CXA1448N	
IC508	8-759-512-69	IC S-81350HG-KD	
IC509	8-759-145-63	IC uPD7564G-540	
IC510	8-759-039-01	IC MPC1720M	
IC511	8-759-044-78	IC AK6420F	
IC701	8-759-031-58	IC SC7SU04F	
IC702	8-759-635-27	IC M62352GP	
IC703	8-759-069-29	IC uPD6456GS-618	
IC704	8-752-348-92	IC CXD2101AR	
IC705	8-759-063-18	IC CXD2103AR	
IC706	8-752-337-36	IC CXD2104N	
IC707	8-752-337-32	IC CXD2100Q	
IC709	8-752-837-59	IC CXP80624-299Q	
IC712	8-759-044-78	IC AK6420F	
IC801	8-752-337-34	IC CXD1257R	
IC802	8-752-056-39	IC CXA1507BR	
IC803	8-752-053-26	IC CXA1399Q	
IC804	8-752-327-48	IC CXD1250N	
IC805	8-752-054-61	IC CXA1390AR	
IC851	8-759-981-82	IC RC3414M	
IC852	8-759-998-96	IC LM324D	
IC853	8-759-038-81	IC MPC1724M	
IC854	8-759-823-51	IC LB1830M	
IC855	8-759-998-98	IC LM358D	

(COIL)

Ref. No.	Part No.	Description	Remark
L001	1-412-033-11	INDUCTOR CHIP 220uH	
L002	1-412-033-11	INDUCTOR CHIP 220uH	
L003	1-412-033-11	INDUCTOR CHIP 220uH	
L004	1-412-029-11	INDUCTOR CHIP 10uH	
L041	1-412-033-11	INDUCTOR CHIP 220uH	
L042	1-410-381-11	INDUCTOR CHIP 10uH	
L501	1-412-029-11	INDUCTOR CHIP 10uH	
L502	1-412-029-11	INDUCTOR CHIP 10uH	
L503	1-412-028-11	INDUCTOR CHIP 4.7uH	
L504	1-412-028-11	INDUCTOR CHIP 4.7uH	
L506	1-412-029-11	INDUCTOR CHIP 10uH	
L701	1-412-006-31	INDUCTOR CHIP 10uH	
L702	1-412-006-31	INDUCTOR CHIP 10uH	
L703	1-412-006-31	INDUCTOR CHIP 10uH	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
L704	1-412-006-31	INDUCTOR CHIP 10uH	
L706	1-412-029-11	INDUCTOR CHIP 10uH	
L714	1-412-011-31	INDUCTOR CHIP 27uH	
L715	1-412-029-11	INDUCTOR CHIP 10uH	
L716	1-412-026-11	INDUCTOR CHIP 1uH	
L717	1-412-029-11	INDUCTOR CHIP 10uH	
L719	1-412-006-31	INDUCTOR CHIP 10uH	
L722	1-412-006-31	INDUCTOR CHIP 10uH	
L723	1-410-391-11	INDUCTOR CHIP 68uH	
L730	1-412-026-11	INDUCTOR CHIP 1uH	
L731	1-412-026-11	INDUCTOR CHIP 1uH	
L732	1-412-026-11	INDUCTOR CHIP 1uH	
L733	1-412-979-21	INDUCTOR 1uH	
L734	1-412-979-21	INDUCTOR 1uH	
L801	1-412-029-11	INDUCTOR CHIP 10uH	
L802	1-412-006-31	INDUCTOR CHIP 10uH	
L803	1-412-029-11	INDUCTOR CHIP 10uH	
L804	1-412-029-11	INDUCTOR CHIP 10uH	
L851	1-412-029-11	INDUCTOR CHIP 10uH	
L852	1-410-993-11	INDUCTOR CHIP 1uH	
L853	1-412-029-11	INDUCTOR CHIP 10uH	
		(IC LINK)	
⚠PS501	1-576-123-21	LINK, IC (CCP2E20 0.8A)	
		(TRANSISTOR)	
Q001	8-729-420-20	TRANSISTOR XN4312	
Q002	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q003	8-729-905-12	TRANSISTOR DTA144EU	
Q041	8-729-905-23	TRANSISTOR 2SA1576-R	
Q043	8-729-216-22	TRANSISTOR 2SA1162-G	
Q501	8-729-907-00	TRANSISTOR DTC114EU	
Q502	8-729-402-78	TRANSISTOR XN6401	
Q503	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q507	8-729-905-12	TRANSISTOR DTA144EU	
Q509	8-729-822-84	TRANSISTOR 2SB1202FAST	
Q510	8-729-402-81	TRANSISTOR XN4501	
Q511	8-729-402-81	TRANSISTOR XN4501	
Q702	8-729-402-84	TRANSISTOR XN4601	
Q703	8-729-010-60	TRANSISTOR MSA1586-BC	
Q704	8-729-010-60	TRANSISTOR MSA1586-BC	
Q707	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q708	8-729-920-XX	TRANSISTOR DTA114EU	
Q709	8-729-905-61	TRANSISTOR DTC124EU	
Q801	8-729-423-52	TRANSISTOR 2SC3931-C	
Q802	8-729-403-27	TRANSISTOR XN4401	
Q851	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q853	8-729-403-27	TRANSISTOR XN4401	

Ref. No.	Part No.	Description	Remark
		(RESISTOR)	
R001	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R003	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R004	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R005	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R006	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R007	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R008	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R009	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R011	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R012	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R013	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R014	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R015	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R018	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R019	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R020	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R021	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R022	1-216-864-11	METAL CHIP 0 5% 1/16W	
R023	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R024	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R025	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R026	1-216-817-11	METAL CHIP 470 5% 1/16W	
R041	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R042	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R043	1-216-815-11	METAL CHIP 330 5% 1/16W	
R044	1-216-817-11	METAL CHIP 470 5% 1/16W	
R046	1-216-801-11	METAL CHIP 22 5% 1/16W	
R047	1-216-818-11	METAL CHIP 560 5% 1/16W	
R048	1-216-864-11	METAL CHIP 0 5% 1/16W	
R501	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R502	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R503	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R504	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R505	1-216-817-11	METAL CHIP 470 5% 1/16W	
R506	1-216-852-11	METAL CHIP 390K 5% 1/16W	
R507	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R508	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R509	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R510	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R511	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R512	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R513	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R515	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R516	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R517	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R518	1-216-809-11	METAL CHIP 100 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

CS-31

Ref. No.	Part No.	Description				Remark
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R521	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R523	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R524	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R526	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R530	1-216-813-11	METAL CHIP	220	5%	1/16W	
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R533	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R539	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R540	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R541	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R543	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R544	1-216-815-11	METAL CHIP	330	5%	1/16W	
R545	1-216-039-00	METAL CHIP	390	5%	1/10W	
R547	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R549	1-217-671-11	METAL CHIP	1	5%	1/10W	
R550	1-217-671-11	METAL CHIP	1	5%	1/10W	
R551	1-217-671-11	METAL CHIP	1	5%	1/10W	
R552	1-217-671-11	METAL CHIP	1	5%	1/10W	
R553	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R555	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R556	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R557	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R559	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R560	1-216-864-11	METAL CHIP	0	5%	1/16W	
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R565	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R568	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R569	1-216-817-11	METAL CHIP	470	5%	1/16W	
R570	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R573	1-216-861-11	METAL CHIP	2.2M	5%	1/16W	
R574	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R575	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R577	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R578	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R579	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R584	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R585	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R586	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R587	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R589	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R590	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R591	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R592	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R594	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R600	1-216-809-11	METAL CHIP	100	5%	1/16W	
R601	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R603	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R607	1-216-295-00	METAL CHIP	0	5%	1/10W	
R608	1-216-295-00	METAL CHIP	0	5%	1/10W	
R609	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R611	1-216-864-11	METAL CHIP	0	5%	1/16W	
R701	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R703	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R704	1-216-815-11	METAL CHIP	330	5%	1/16W	
R705	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R706	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R707	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R708	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R709	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R710	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R711	1-216-864-11	METAL CHIP	0	5%	1/16W	
R712	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R713	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R714	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R715	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R716	1-216-863-11	METAL CHIP	3.3M	5%	1/16W	
R718	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R719	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R723	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R727	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R729	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R730	1-216-864-11	METAL CHIP	0	5%	1/16W	
R732	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R733	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R734	1-216-817-11	METAL CHIP	470	5%	1/16W	
R735	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R736	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R737	1-216-813-11	METAL CHIP	220	5%	1/16W	
R738	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R739	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R740	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R741	1-216-864-11	METAL CHIP	0	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R742	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R745	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R748	1-216-864-11	METAL CHIP	0	5%	1/16W	
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R750	1-216-864-11	METAL CHIP	0	5%	1/16W	
R752	1-216-816-11	METAL CHIP	390	5%	1/16W	
R753	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R756	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R757	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R765	1-216-814-11	METAL CHIP	270	5%	1/16W	
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R771	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R777	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R787	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R794	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R795	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R796	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R799	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R801	1-216-864-11	METAL CHIP	0	5%	1/16W	
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R808	1-216-801-11	METAL CHIP	22	5%	1/16W	
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R815	1-216-817-11	METAL CHIP	470	5%	1/16W	
R816	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R819	1-216-805-11	METAL CHIP	47	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R826	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R836	1-216-863-11	METAL CHIP	3.3M	5%	1/16W	
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R854	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R857	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R858	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R859	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R863	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R864	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R865	1-218-879-11	METAL CHIP	22K	0.50%	1/16W	
R866	1-216-820-11	METAL CHIP	820	5%	1/16W	
R867	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R868	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R869	1-218-744-11	METAL CHIP	150K	0.50%	1/16W	
R870	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R871	1-218-871-11	METAL CHIP	10K	0.50%	1/16W	
R872	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R873	1-216-816-11	METAL CHIP	390	5%	1/16W	
R874	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R875	1-216-134-00	METAL CHIP	2.2	5%	1/8W	
R876	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R877	1-218-881-11	METAL CHIP	27K	0.50%	1/16W	
R884	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R885	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

〈 COMPOSITION CIRCUIT BLOCK 〉

Ref. No.	Part No.	Description		Remark
RB501	1-236-412-11	NETWORK, RES	1.0K	
RB502	1-236-424-11	NETWORK, RES	10K	
RB503	1-236-412-11	NETWORK, RES	1.0K	
RB504	1-236-442-11	NETWORK, RES	330K	
RB505	1-236-424-11	NETWORK, RES	10K	
RB506	1-236-424-11	NETWORK, RES	10K	
RB509	1-236-904-11	NETWORK, RES	1.0K	
RB510	1-236-432-11	NETWORK, RES	47K	
RB512	1-236-424-11	NETWORK, RES	10K	
RB513	1-236-432-11	NETWORK, RES	47K	
RB516	1-236-904-11	NETWORK, RES	1.0K	
RB517	1-236-436-11	NETWORK, RES	100K	
RB518	1-236-907-11	NETWORK, RES	100K	
RB519	1-236-908-11	NETWORK, RES	10K	
RB520	1-236-412-11	NETWORK, RES	1.0K	

Ref. No.	Part No.	Description	Remark
RB522	1-236-424-11	NETWORK, RES 10K	
RB523	1-236-424-11	NETWORK, RES 10K	
RB526	1-236-408-11	NETWORK, RES 470	
RB527	1-236-432-11	NETWORK, RES 47K	
RB528	1-236-432-11	NETWORK, RES 47K	
RB529	1-236-424-11	NETWORK, RES 10K	
RB530	1-236-420-11	NETWORK, RES 4.7K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB708	1-236-416-11	NETWORK, RES 2.2K	
RB709	1-236-416-11	NETWORK, RES 2.2K	
RB710	1-236-412-11	NETWORK, RES 1.0K	
RB711	1-236-412-11	NETWORK, RES 1.0K	
RB712	1-236-412-11	NETWORK, RES 1.0K	
RB713	1-236-412-11	NETWORK, RES 1.0K	
RB714	1-236-412-11	NETWORK, RES 1.0K	
RB740	1-236-432-11	NETWORK, RES 47K	

(VIBRATOR)

Ref. No.	Part No.	Description	Remark
X501	1-579-368-31	VIBRATOR, CRYSTAL (11.718MHz)	
X502	1-579-550-11	VIBRATOR, CRYSTAL (32KHz)	
X503	1-578-713-21	VIBLATOR, CERAMIC (4.19MHz)	
X504	1-579-551-11	VIBRATOR, CERAMIC (700KHz)	
X701	1-579-553-11	VIBRATOR (10MHz)	
X801	1-579-076-11	VIBRATOR, CRYSTAL (28.375MHz)	

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* A-7071-638-A DK-20 BOARD, COMPLETE

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(Ref,No 7,000 Series)

(SWITCH)

Ref. No.	Part No.	Description	Remark
S561	1-572-938-21	SWITCH, TACTIL (RESET)	
S562	1-572-938-21	SWITCH, TACTIL (ZEROMEM)	
S563	1-572-938-21	SWITCH, TACTIL (TAPE/BATT CHECK)	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

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* A-7063-246-A MA-93 BOARD, COMPLETE

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(Ref,No 3,000 Series)

Ref. No.	Part No.	Description	Remark
	1-690-603-11	CABLE, FLAT (FFC-25) 8P	

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C400	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C401	1-164-677-11	CERAMIC CHIP 0.033uF 10% 16V	
C402	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C403	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C404	1-162-587-11	CERAMIC CHIP 0.039uF 10% 25V	
C405	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C406	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C407	1-162-638-11	CERAMIC CHIP 1uF 16V	
C410	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C411	1-162-638-11	CERAMIC CHIP 1uF 16V	
C412	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C415	1-162-638-11	CERAMIC CHIP 1uF 16V	
C417	1-164-299-11	CERAMIC CHIP 0.22uF 10% 25V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN400	1-580-057-11	PIN, CONNECTOR 4P	

(DIODE)

Ref. No.	Part No.	Description	Remark
D400	8-719-110-03	DIODE RD7.5ES-B2	
D401	8-719-110-03	DIODE RD7.5ES-B2	

(IC)

Ref. No.	Part No.	Description	Remark
IC400	8-759-822-37	IC LA7293M-TE-L	
IC401	8-749-923-29	IC RS-20E-T	

(JACK)

Ref. No.	Part No.	Description	Remark
J400	1-568-027-11	JACK, SMALL TYPE 1P (MIC)	

(COIL)

Ref. No.	Part No.	Description	Remark
L400	1-410-993-11	INDUCTOR CHIP 1uH	
L401	1-410-993-11	INDUCTOR CHIP 1uH	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q400	8-729-905-23	TRANSISTOR 2SA1576-R	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R400	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R401	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R402	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R403	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R405	1-216-864-11	METAL CHIP 0 5% 1/16W	
R407	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R412	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R414	1-216-864-11	METAL CHIP 0 5% 1/16W	

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* A-7071-634-A PJ-45 BOARD, COMPLETE (AEP/UK)

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* A-7071-676-A PJ-45 BOARD, COMPLETE (AUS)

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(Ref,No 9,000 Series)

Ref. No.	Part No.	Description	Remark
		(BUZZER)	
BU550	1-529-107-11	BUZZER, PIEZOELECTRIC	
		(CAPACITOR)	
C550	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C551	1-164-346-11	CERAMIC CHIP 1uF 16V	
C552	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C553	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		(CONNECTOR)	
CN550	1-691-491-21	CONNECTOR, FFC/FPC 12P	
		(DIODE)	
D550	8-719-404-46	DIODE MA110	
D551	8-719-110-03	DIODE RD7.5ES-B2	
D552	8-719-110-03	DIODE RD7.5ES-B2	
		(RESISTOR)	
R552	1-216-864-11	METAL CHIP 0 5% 1/16W	(AEP/UK)
		(SWITCH)	
S550	1-571-275-31	SWITCH, SLIDE (EDIT,REC MODE)	
S551	1-571-674-11	SWITCH, SLIDE (VIDEO IN/OUT)(AUS)	

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* A-7071-639-A PK-30 BOARD, COMPLETE

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(Ref,No 8,000 Series)

Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P	
		(DIODE)	
D540	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S540	1-572-283-11	SWITCH, SLIDE (POWER)	
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	
S542	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER)	

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* A-7063-242-A PS-282 BOARD, COMPLETE

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(Ref,No 3,000 Series)

Ref. No.	Part No.	Description	Remark
		(CAPACITOR)	
C948	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C949	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C950	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C951	1-164-384-11	CERAMIC CHIP 130PF 5% 50V	
C952	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C953	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C954	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C957	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C958	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C959	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C960	1-164-730-11	CERAMIC CHIP 0.0012uF 5% 50V	
C961	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C962	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C963	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C965	1-162-966-11	CERAMIC CHIP 0.002uF 10% 50V	
C966	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C968	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C969	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C970	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C971	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C972	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C973	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C974	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C975	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C976	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C977	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C978	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C979	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C980	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C981	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C982	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C983	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C984	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C985	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C986	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C987	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C988	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C989	1-127-559-11	ELECT (SOLID) 15uF 20% 6.3V	
C990	1-164-346-11	CERAMIC CHIP 1uF 16V	
C991	1-164-346-11	CERAMIC CHIP 1uF 16V	
C992	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C993	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C994	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C995	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C996	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C997	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C998	1-128-530-11	ELECT CHIP 33uF 20% 10V	
		(CONNECTOR)	
CN950	1-691-542-21	CONNECTOR, BOARD TO BOARD 48P	

PS-282

Ref. No.	Part No.	Description	Remark
		(DIODE)	
D950	8-719-989-33	DIODE FC806	
D952	8-719-110-03	DIODE RD7.5ES-B2	
D953	8-719-110-03	DIODE RD7.5ES-B2	
D961	8-719-404-46	DIODE MA110	
D962	8-719-110-03	DIODE RD7.5ES-B2	
D963	8-719-110-03	DIODE RD7.5ES-B2	
D964	8-719-404-46	DIODE MA110	
		(IC)	
⚠IC950	8-759-060-94	IC MB3785APFV-G-BND-ER	
		(JACK)	
J950	1-537-281-31	TERMINAL BOARD (EASY CONNECTOR)	
J951	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
J952	1-568-027-11	JACK, SMALL TYPE 1P (EARPHONE)	
		(COIL)	
L950	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L951	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L952	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L953	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L954	1-424-522-21	COIL, CHOKE 10uH	
L955	1-424-522-21	COIL, CHOKE 10uH	
L956	1-424-522-21	COIL, CHOKE 10uH	
L957	1-424-524-21	COIL, CHOKE 47uH	
L958	1-412-034-11	INDUCTOR CHIP 330uH	
L959	1-412-034-11	INDUCTOR CHIP 330uH	
L960	1-412-027-11	INDUCTOR CHIP 2.2uH	
L961	1-412-029-11	INDUCTOR CHIP 10uH	
L962	1-412-029-11	INDUCTOR CHIP 10uH	
L963	1-412-028-11	INDUCTOR CHIP 4.7uH	
L964	1-424-524-21	COIL, CHOKE 47uH	
L965	1-424-524-21	COIL, CHOKE 47uH	
L966	1-410-369-11	INDUCTOR CHIP 1uH	
L967	1-410-369-11	INDUCTOR CHIP 1uH	
L968	1-412-979-21	INDUCTOR 1uH	
L972	1-412-979-21	INDUCTOR 1uH	
L973	1-412-026-11	INDUCTOR CHIP 1uH	
L974	1-412-979-21	INDUCTOR 1uH	
L976	1-412-026-11	INDUCTOR CHIP 1uH	
		(IC LINK)	
⚠PS950	1-532-841-21	LINK, IC (SOC1600 1.6A)	
⚠PS951	1-532-841-21	LINK, IC (SOC1600 1.6A)	
		(TRANSISTOR)	
Q950	8-729-823-95	TRANSISTOR FC149	
Q951	8-729-804-41	TRANSISTOR 2SB1122-ST	
Q952	8-729-823-84	TRANSISTOR FP102	
Q953	8-729-823-82	TRANSISTOR FP101	
Q954	8-729-823-82	TRANSISTOR FP101	
Q955	8-729-905-12	TRANSISTOR DTA144EU	
Q957	8-729-011-26	TRANSISTOR 2SJ179	
Q958	8-729-920-48	TRANSISTOR IMH2	
Q959	8-729-011-26	TRANSISTOR 2SJ179	
Q960	8-729-402-81	TRANSISTOR XN4501	
		(RESISTOR)	
R950	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R951	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R952	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R953	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R954	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R955	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R956	1-218-347-11	METAL CHIP 91K 5% 1/16W	
R957	1-218-332-11	METAL CHIP 130K 5% 1/16W	
R958	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R959	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R960	1-218-296-11	METAL CHIP 75K 0.50% 1/16W	
R961	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R962	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R964	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R965	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R966	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R967	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R968	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R969	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R970	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R971	1-218-330-11	METAL CHIP 11K 0.50% 1/16W	
R972	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R973	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R974	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R975	1-216-176-00	METAL CHIP 120 5% 1/8W	
R976	1-216-182-00	METAL CHIP 220 5% 1/8W	
R977	1-216-182-00	METAL CHIP 220 5% 1/8W	
R978	1-216-182-00	METAL CHIP 220 5% 1/8W	
R980	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R981	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R982	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R983	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R984	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R985	1-218-883-11	METAL CHIP 33K 0.50% 1/16W	
R986	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R987	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R988	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R989	1-216-820-11	METAL CHIP 820 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		(TRANSFORMER)	
T950	1-450-768-21	TRANSFORMER, CONVERTER	
		(VIBRATOR)	
X950	1-579-467-11	VIBRATOR, CERAMIC (475KHz)	
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*	A-7063-245-A	SL-22 BOARD, COMPLETE ********************** (Ref.No 3,000 Series)	
		(CAPACITOR)	
C500	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C503	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C504	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C505	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C506	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C507	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
		(CONNECTOR)	
CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P	
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P	
		(IC)	
IC501	8-759-059-09	IC LB8111V	
		(COIL)	
L501	1-412-026-11	INDUCTOR CHIP 1uH	
		(TRANSISTOR)	
Q501	8-729-402-81	TRANSISTOR XN4501	
		(RESISTOR)	
R501	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R504	1-216-864-11	METAL CHIP 0 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R512	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R517	1-216-174-00	METAL CHIP 100 5% 1/8W	
R519	1-216-864-11	METAL CHIP 0 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0 5% 1/16W	
		(COMPOSITION CIRCUIT BLOCK)	
RB500	1-236-424-11	NETWORK, RES 10K	
RB502	1-236-424-11	NETWORK, RES 10K	

Ref. No.	Part No.	Description	Remark
		(FLAT CABLE)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	
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*	A-7071-633-A	SW-200 BOARD, COMPLETE ********************** (Ref.No 5,000 Series)	
		(CONNECTOR)	
CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P	
		(SWITCH)	
S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)	
S581	1-571-275-31	SWITCH, SLIDE (STAND BY)	
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*	A-7063-244-A	VA-71 BOARD, COMPLETE (AEP/UK) *********************	
*	A-7063-295-A	VA-71 BOARD, COMPLETE (AUS) ********************* (Ref.No 2,000 Series)	
*	3-946-181-01	CASE (MAIN), SHIELD, VA	
*	3-946-182-01	CASE (LID), SHIELD, VA	
		(CAPACITOR)	
C052	1-162-638-11	CERAMIC CHIP 1uF 16V	
C053	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C054	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C055	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C056	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C057	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C058	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C059	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C060	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C061	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C062	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C063	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C064	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C065	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C066	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C070	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C071	1-128-003-11	ELECT CHIP 22uF 20% 4V	
C072	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C073	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C074	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C075	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C077	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C078	1-162-943-11	CERAMIC CHIP 15PF 5% 50V	
C090	1-162-974-11	CERAMIC CHIP 0.01uF 50V	

VA-71

Ref. No.	Part No.	Description				Remark
C091	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C093	1-164-506-11	CERAMIC CHIP	4.7uF		16V	
C095	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C096	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C101	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C104	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C105	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C106	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C107	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C109	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C110	1-162-934-11	CERAMIC CHIP	3PF	0.5PF	50V	
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C113	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C114	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C117	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C119	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C121	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C123	1-162-922-11	CERAMIC CHIP	39PF	5%	50V	
C124	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V	
C125	1-162-926-11	CERAMIC CHIP	82PF	5%	50V	
C126	1-162-923-11	CERAMIC CHIP	47PF	5%	50V	
C127	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C202	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C209	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C212	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C213	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C214	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C217	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C218	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C219	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C221	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C223	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C224	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C226	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C227	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C228	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C229	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C230	1-126-246-11	ELECT CHIP	220uF	20%	4V	
C231	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C232	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C237	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C238	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V	
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C242	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C244	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V	
C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C252	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	
C253	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C254	1-164-363-11	CERAMIC CHIP	560PF	5%	50V	
C255	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C256	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C257	1-126-207-11	ELECT CHIP	33uF	20%	4V	
C258	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C260	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C261	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C271	1-162-946-11	CERAMIC CHIP	27PF	5%	50V	
C272	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C273	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C274	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	
C276	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C277	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C279	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C280	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C282	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C295	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C303	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V	

Ref. No.	Part No.	Description				Remark
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C308	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C311	1-126-192-11	ELECT CHIP	0.68uF	20%	50V	
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C314	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C316	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V	
C320	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C323	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C361	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V	
C362	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C363	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C364	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C365	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C366	1-162-638-11	CERAMIC CHIP	1uF		16V	
C367	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C368	1-164-383-11	CERAMIC CHIP	110PF	5%	50V	
C369	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C370	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C371	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C372	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C373	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C374	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C376	1-162-638-11	CERAMIC CHIP	1uF		16V	
C377	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C378	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C379	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C400	1-124-778-00	ELECT CHIP	22uF	20%	6.3V	
C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C406	1-164-346-11	CERAMIC CHIP	1uF		16V	
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C416	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C427	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C428	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C429	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C430	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C432	1-164-346-11	CERAMIC CHIP	1uF		16V	
C434	1-164-346-11	CERAMIC CHIP	1uF		16V	
C435	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C439	1-164-346-11	CERAMIC CHIP	1uF		16V	
C440	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C442	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C443	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C444	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C446	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C448	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C450	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C453	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V	
C454	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C456	1-164-346-11	CERAMIC CHIP	1uF		16V	
C459	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C461	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C490	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C494	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C498	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C990	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C991	1-162-974-11	CERAMIC CHIP	0.01uF		50V	

(FILTER)

Ref. No.	Part No.	Description	Remark
CF301	1-579-371-11	FILTER, CERAMIC	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P	
CN202	1-691-476-21	CONNECTOR, BOARD TO BOARD 20P	
CN400	1-691-487-21	CONNECTOR, FFC/FPC 8P	

(DIODE)

Ref. No.	Part No.	Description		Remark
D102	8-719-800-76	DIODE	1SS226	
D201	8-719-941-86	DIODE	DAN202U	
D202	8-719-941-86	DIODE	DAN202U	
D203	8-719-941-09	DIODE	DAP202U	
D205	8-719-941-86	DIODE	DAN202U	

VA-71

Ref. No.	Part No.	Description	Remark
D206	8-719-941-86	DIODE DAN202U	
D301	8-719-940-45	DIODE DWA010	
D361	8-719-941-86	DIODE DAN202U	
D362	8-719-941-86	DIODE DAN202U	
D401	8-719-105-32	DIODE RD2.7M-B2	

〈 FILTER 〉

Ref. No.	Part No.	Description	Remark
FL051	1-236-848-21	FILTER, LOW PASS	
FL052	1-239-055-21	FILTER, LOW PASS (CCD.PAL.Y)	
FL053	1-236-834-21	FILTER, LOW PASS	
FL054	1-415-751-21	DELAY LINE, LC (YH)	
FL201	1-239-113-21	FILTER, LOW PASS (REC.Y)	
FL301	1-236-849-21	FILTER, BAND PASS	
FL302	1-236-186-11	FILTER, BAND PASS	
FL361	1-236-850-21	FILTER, BAND PASS	

〈 IC 〉

Ref. No.	Part No.	Description	Remark
IC051	8-752-333-24	IC CXL1506M	
IC052	8-759-710-29	IC NJM2235M	
IC053	8-759-031-84	IC SC7S04F	
IC054	8-752-053-21	IC CXA1211M	
IC201	8-752-036-19	IC CXA1207AR	
IC202	8-759-710-29	IC NJM2235M	
IC203	8-759-055-82	IC M62353GP	
IC204	8-759-055-82	IC M62353GP	
IC205	8-759-636-33	IC CXA1452	
IC206	8-752-053-21	IC CXA1211M	
IC301	8-752-036-20	IC CXA1208R	
IC361	8-759-605-61	IC CXA1203N	
IC400	8-759-234-77	IC TC4S66F	
IC401	8-759-824-22	IC CXA1535R	

〈 COIL 〉

Ref. No.	Part No.	Description	Remark
L051	1-412-026-11	INDUCTOR CHIP 1uH	
L052	1-412-031-11	INDUCTOR CHIP 47uH	
L053	1-412-029-11	INDUCTOR CHIP 10uH	
L054	1-410-656-11	INDUCTOR CHIP 150uH	
L090	1-412-029-11	INDUCTOR CHIP 10uH	
L101	1-412-029-11	INDUCTOR CHIP 10uH	
L102	1-410-385-11	INDUCTOR CHIP 22uH	
L103	1-412-280-31	INDUCTOR 330uH	
L104	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L109	1-410-657-21	INDUCTOR CHIP 180uH	
L110	1-410-387-11	INDUCTOR CHIP 33uH	
L113	1-410-381-11	INDUCTOR CHIP 10uH	
L114	1-410-380-31	INDUCTOR CHIP 8.2uH	
L115	1-412-280-31	INDUCTOR 330uH	
L116	1-410-655-31	INDUCTOR CHIP 120uH	
L117	1-410-658-31	INDUCTOR CHIP 220uH	
L202	1-412-031-11	INDUCTOR CHIP 47uH	

Ref. No.	Part No.	Description	Remark
L203	1-412-029-11	INDUCTOR CHIP 10uH	
L204	1-410-393-11	INDUCTOR CHIP 100uH	
L205	1-410-375-11	INDUCTOR CHIP 3.3uH	
L206	1-410-379-21	INDUCTOR CHIP 6.8uH	
L207	1-410-390-11	INDUCTOR CHIP 56uH	
L208	1-410-389-31	INDUCTOR CHIP 47uH	
L209	1-410-658-31	INDUCTOR CHIP 220uH	
L210	1-410-370-31	INDUCTOR CHIP 1.2uH	
L211	1-410-390-11	INDUCTOR CHIP 56uH	
L212	1-410-370-31	INDUCTOR CHIP 1.2uH	
L213	1-410-386-11	INDUCTOR CHIP 27uH	
L302	1-410-386-11	INDUCTOR CHIP 27uH	
L303	1-410-393-11	INDUCTOR CHIP 100uH	
L304	1-410-379-21	INDUCTOR CHIP 6.8uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L308	1-410-393-11	INDUCTOR CHIP 100uH	
L990	1-412-026-11	INDUCTOR CHIP 1uH	

〈 TRANSISTOR 〉

Ref. No.	Part No.	Description	Remark
Q051	8-729-920-48	TRANSISTOR IMH2	
Q052	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q053	8-729-905-23	TRANSISTOR 2SA1576-R	
Q054	8-729-905-23	TRANSISTOR 2SA1576-R	
Q055	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q056	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q057	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q060	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q061	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q063	8-729-422-54	TRANSISTOR XN4215	
Q064	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q065	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q066	8-729-905-23	TRANSISTOR 2SA1576-R	
Q067	8-729-905-96	TRANSISTOR DTA114TU	
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q104	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q110	8-729-920-XX	TRANSISTOR DTA114EU	
Q111	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q114	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q118	8-729-920-48	TRANSISTOR IMH2	
Q119	8-729-905-23	TRANSISTOR 2SA1576-R	
Q120	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q121	8-729-905-23	TRANSISTOR 2SA1576-R	
Q122	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q202	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q207	8-729-905-12	TRANSISTOR DTA144EU	
Q212	8-729-920-48	TRANSISTOR IMH2	
Q213	8-729-905-18	TRANSISTOR DTC144EU	

Ref. No.	Part No.	Description		Remark
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YQ	
Q215	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q216	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q217	8-729-905-12	TRANSISTOR	DTA144EU	
Q218	8-729-402-81	TRANSISTOR	XN4501	
Q220	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q222	8-729-402-81	TRANSISTOR	XN4501	
Q223	8-729-905-12	TRANSISTOR	DTA144EU	
Q224	8-729-905-18	TRANSISTOR	DTC144EU	
Q225	8-729-905-18	TRANSISTOR	DTC144EU	
Q226	8-729-823-16	TRANSISTOR	2SC4555-5. 6. 7	
Q227	8-729-905-18	TRANSISTOR	DTC144EU	
Q228	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q229	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q230	8-729-905-23	TRANSISTOR	2SA1576-R	
Q231	8-729-925-42	TRANSISTOR	IMT2	
Q232	8-729-905-23	TRANSISTOR	2SA1576-R	
Q233	8-729-925-42	TRANSISTOR	IMT2	
Q234	8-729-905-18	TRANSISTOR	DTC144EU	
Q235	8-729-905-23	TRANSISTOR	2SA1576-R	
Q302	8-729-402-81	TRANSISTOR	XN4501	
Q304	8-729-905-12	TRANSISTOR	DTA144EU	
Q306	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q307	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q308	8-729-905-23	TRANSISTOR	2SA1576-R	
Q309	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q310	8-729-905-18	TRANSISTOR	DTC144EU	
Q311	8-729-905-23	TRANSISTOR	2SA1576-R	
Q312	8-729-420-20	TRANSISTOR	XN4312	
Q313	8-729-905-12	TRANSISTOR	DTA144EU	
Q314	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q315	8-729-905-12	TRANSISTOR	DTA144EU	
Q316	8-729-920-48	TRANSISTOR	IMH2	
Q317	8-729-420-20	TRANSISTOR	XN4312	
Q318	8-729-905-18	TRANSISTOR	DTC144EU	
Q319	8-729-905-18	TRANSISTOR	DTC144EU	
Q361	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q362	8-729-905-18	TRANSISTOR	DTC144EU	
Q363	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q364	8-729-905-12	TRANSISTOR	DTA144EU	
Q365	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q366	8-729-905-18	TRANSISTOR	DTC144EU	
Q367	8-729-905-18	TRANSISTOR	DTC144EU	
Q368	8-729-905-12	TRANSISTOR	DTA144EU	
Q401	8-729-921-08	TRANSISTOR	DTC144TU	
Q402	8-729-905-18	TRANSISTOR	DTC144EU	
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ	
Q991	8-729-120-28	TRANSISTOR	2SC1623-L5L6	

〈 RESISTOR 〉

Ref. No.	Part No.	Description				Remark
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R053	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W	
R054	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R055	1-216-810-11	METAL CHIP	120	5%	1/16W	
R056	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R058	1-216-864-11	METAL CHIP	0	5%	1/16W	
R062	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R063	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R064	1-216-817-11	METAL CHIP	470	5%	1/16W	
R065	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R066	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R067	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R068	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R069	1-216-817-11	METAL CHIP	470	5%	1/16W	
R070	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R071	1-216-826-11	METAL CHIP	2. 7K	5%	1/16W	
R072	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R073	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R074	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R075	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R076	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R077	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R078	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R079	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R081	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R082	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R083	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R085	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W	
R086	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W	
R088	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R089	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R090	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R091	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	
R092	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R093	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R107	1-216-811-11	METAL CHIP	150	5%	1/16W	
R108	1-216-831-11	METAL CHIP	6. 8K	5%	1/16W	
R109	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R110	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R111	1-216-813-11	METAL CHIP	220	5%	1/16W	
R114	1-216-819-11	METAL CHIP	680	5%	1/16W	
R125	1-216-826-11	METAL CHIP	2. 7K	5%	1/16W	
R126	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R128	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R129	1-216-817-11	METAL CHIP	470	5%	1/16W	

VA-71

Ref. No.	Part No.	Description				Remark
R130	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R131	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R132	1-216-808-11	METAL CHIP	82	5%	1/16W	
R133	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R140	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R143	1-216-804-11	METAL CHIP	39	5%	1/16W	
R144	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R145	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R148	1-216-818-11	METAL CHIP	560	5%	1/16W	
R150	1-216-817-11	METAL CHIP	470	5%	1/16W	
R151	1-216-817-11	METAL CHIP	470	5%	1/16W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-818-11	METAL CHIP	560	5%	1/16W	
R154	1-216-818-11	METAL CHIP	560	5%	1/16W	
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R156	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R157	1-216-864-11	METAL CHIP	0	5%	1/16W	
R158	1-216-817-11	METAL CHIP	470	5%	1/16W	
R159	1-216-815-11	METAL CHIP	330	5%	1/16W	
R201	1-216-820-11	METAL CHIP	820	5%	1/16W	
R202	1-216-820-11	METAL CHIP	820	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R208	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-804-11	METAL CHIP	39	5%	1/16W	
R211	1-216-820-11	METAL CHIP	820	5%	1/16W	
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R213	1-216-804-11	METAL CHIP	39	5%	1/16W	
R214	1-216-804-11	METAL CHIP	39	5%	1/16W	
R215	1-216-807-11	METAL CHIP	68	5%	1/16W	
R216	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R220	1-216-818-11	METAL CHIP	560	5%	1/16W	
R221	1-216-818-11	METAL CHIP	560	5%	1/16W	
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R226	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R227	1-218-672-11	METAL CHIP	150	0.50%	1/16W	
R228	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W	
R229	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R232	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R233	1-218-748-11	METAL CHIP	220K	0.50%	1/16W	
R234	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R235	1-218-688-11	METAL CHIP	680	0.50%	1/16W	
R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R237	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W	
R239	1-216-817-11	METAL CHIP	470	5%	1/16W	
R244	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R248	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R249	1-216-813-11	METAL CHIP	220	5%	1/16W	
R250	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R252	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R253	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R254	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R256	1-216-810-11	METAL CHIP	120	5%	1/16W	
R257	1-216-813-11	METAL CHIP	220	5%	1/16W	
R258	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R260	1-216-815-11	METAL CHIP	330	5%	1/16W	
R261	1-216-864-11	METAL CHIP	0	5%	1/16W	
R262	1-216-815-11	METAL CHIP	330	5%	1/16W	
R263	1-216-820-11	METAL CHIP	820	5%	1/16W	
R264	1-216-864-11	METAL CHIP	0	5%	1/16W	
R265	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R266	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R267	1-216-817-11	METAL CHIP	470	5%	1/16W	
R268	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R269	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R270	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R271	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R276	1-216-817-11	METAL CHIP	470	5%	1/16W	
R277	1-216-817-11	METAL CHIP	470	5%	1/16W	
R278	1-216-818-11	METAL CHIP	560	5%	1/16W	
R279	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R280	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R281	1-216-817-11	METAL CHIP	470	5%	1/16W	
R282	1-216-817-11	METAL CHIP	470	5%	1/16W	
R283	1-216-817-11	METAL CHIP	470	5%	1/16W	
R284	1-216-815-11	METAL CHIP	330	5%	1/16W	
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R286	1-216-812-11	METAL CHIP	180	5%	1/16W	
R287	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R290	1-216-817-11	METAL CHIP	470	5%	1/16W	
R291	1-216-817-11	METAL CHIP	470	5%	1/16W	
R292	1-216-817-11	METAL CHIP	470	5%	1/16W	
R294	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R295	1-216-821-11	METAL CHIP	1K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R296	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R298	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R299	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R301	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R305	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R306	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R307	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R308	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R309	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R310	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R311	1-216-817-11	METAL CHIP	470	5%	1/16W	
R312	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R314	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R315	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R320	1-216-817-11	METAL CHIP	470	5%	1/16W	
R321	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R322	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R323	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R327	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R328	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R329	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R330	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R332	1-216-818-11	METAL CHIP	560	5%	1/16W	
R333	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R334	1-216-864-11	METAL CHIP	0	5%	1/16W	
R337	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R338	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R339	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R340	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R341	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R342	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R343	1-216-813-11	METAL CHIP	220	5%	1/16W	
R345	1-216-864-11	METAL CHIP	0	5%	1/16W	
R347	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R348	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R351	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R352	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R353	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R354	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R355	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R357	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R358	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R359	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R360	1-216-817-11	METAL CHIP	470	5%	1/16W	
R361	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R362	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R363	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R365	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R366	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R367	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R368	1-216-864-11	METAL CHIP	0	5%	1/16W	
R369	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R370	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R372	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R374	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R375	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R378	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R379	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R380	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R381	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R383	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R385	1-216-296-00	METAL CHIP	0	5%	1/8W	
R391	1-216-864-11	METAL CHIP	0	5%	1/16W	
R393	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R400	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R402	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R403	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R404	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R406	1-216-859-11	METAL CHIP	1.5M	5%	1/16W	
R410	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R412	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R413	1-216-864-11	METAL CHIP	0	5%	1/16W	
R414	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R416	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R417	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R419	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R421	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R423	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R429	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R470	1-216-808-11	METAL CHIP	82	5%	1/16W	
R471	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R472	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R473	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R476	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R478	1-216-864-11	METAL CHIP	0	5%	1/16W	
R480	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R481	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R950	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R953	1-216-813-11	METAL CHIP	220	5%	1/16W	
R954	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R955	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R956	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R957	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R958	1-216-815-11	METAL CHIP	330	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R960	1-216-817-11	METAL CHIP 470 5% 1/16W	
R961	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R962	1-216-815-11	METAL CHIP 330 5% 1/16W	
R963	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R964	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R965	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R990	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R991	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R995	1-216-820-11	METAL CHIP 820 5% 1/16W	
R996	1-216-836-11	METAL CHIP 18K 5% 1/16W	
		(COMPOSITION CIRCUIT BLOCK)	
RB101	1-236-428-11	NETWORK, RES 22K	
RB201	1-236-424-11	NETWORK, RES 10K	
RB301	1-236-414-11	NETWORK, RES 1.5K	
		(VARIABLE RESISTOR)	
RV051	1-238-087-11	RES, ADJ, CERMET 1K	
		(THERMISTOR)	
TH101	1-809-355-11	THERMISTOR, NTC (2125)	
		(VIBRATOR)	
X301	1-577-117-21	OSCILLATOR, CRYSTAL (4.433619MHz)	

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Ref. No.	Part No.	Description	Remark
*	A-7063-129-A	VF-44 BOARD, COMPLETE ********************* (Ref.No 2,000 Series)	
		(CAPACITOR)	
C501	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C502	1-126-176-11	ELECT 220uF 20% 10V	
C503	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C504	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
⚠C505	1-163-053-00	CERAMIC CHIP 0.0033uF 10% 50V	
⚠C506	1-163-058-00	CERAMIC CHIP 0.0082uF 10% 50V	
C508	1-127-515-11	ELECT (SOLID) 47uF 20% 6.3V	
C509	1-126-090-11	ELECT 82uF 20% 10V	
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V	
C511	1-124-257-00	ELECT 2.2uF 20% 50V	
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C513	1-137-306-11	FILM CHIP 0.1uF 5% 16V	
C514	1-162-638-11	CERAMIC CHIP 1uF 16V	
C515	1-131-381-00	TANTALUM 47uF 10% 10V	
C516	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C517	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	

Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P	
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
		(DIODE)	
D501	8-719-024-87	DIODE LN1261CAL	
D502	8-719-024-87	DIODE LN1261CAL	
D503	8-719-400-20	DIODE MA152WA	
		(IC)	
IC501	8-759-420-01	IC AN2512S	
		(COIL)	
L501	1-412-031-11	INDUCTOR CHIP 47uH	
L502	1-410-385-11	INDUCTOR CHIP 22uH	
⚠L503	1-460-220-11	COIL, FERRITE (HLC)	
		(TRANSISTOR)	
Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	
		(RESISTOR)	
R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R502	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
R508	1-216-005-00	METAL CHIP 15 5% 1/10W	
R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R510	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R511	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R518	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R519	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R521	1-216-160-00	METAL CHIP 27 5% 1/8W	
R522	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R523	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R525	1-216-031-00	METAL CHIP 180 5% 1/10W	
R526	1-216-748-11	METAL CHIP 39K 1% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description	Remark
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K	
RV502	1-241-497-11	RES, ADJ, METAL GLAZE	
RV503	1-238-096-11	RES, ADJ, CERMET 1M	
RV503	1-238-862-11	RES, ADJ, CERMET 1M	
RV504	1-238-092-11	RES, ADJ, CERMET 47K	
RV504	1-238-858-11	RES, ADJ, CERMET 47K	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
RV505	1-238-852-11	RES, ADJ, CERMET 470	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL)(EDIT (+))	
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL)(EDIT (-))	

(TRANSFORMER)

Ref. No.	Part No.	Description	Remark
⚠T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK	

(THERMISTOR)

Ref. No.	Part No.	Description	Remark
TH501	1-809-350-21	THERMISTOR, NTC (2125)	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W502	1-526-978-51	SOCKET ASSY, CRT	

****

Ref. No.	Part No.	Description	Remark
*	A-7071-632-A	VK-22 BOARD, COMPLETE (AEP/UK) *********************	
*	A-7071-677-A	VK-22 BOARD, COMPLETE (AUS) ********************* (Ref,No 5,000 Series)	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN571	1-691-487-21	CONNECTOR, FFC/FPC 8P	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P	
* CN575	1-580-055-21	PIN, CONNECTOR 2P	

(DIODE)

Ref. No.	Part No.	Description	Remark
D570	8-719-820-05	DIODE 1SS181	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S570	1-572-498-11	SWITCH, SLIDE (EJECT)	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)	
S572	1-572-921-31	SWITCH, KEY BOARD (FF)	
S573	1-572-921-31	SWITCH, KEY BOARD (PB)	
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)	
S575	1-572-498-11	SWITCH, SLIDE (REC)(AUS)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
W573	1-690-606-11	CABLE, FLAT (FFC-32) 8P	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
11	1-550-743-11	HOLDER, BATTERY	
25	1-542-126-41	MICROPHONE UNIT	
30	1-241-771-11	RES, VAR (FOCUS RING)	
36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
105	1-692-025-11	SWITCH, PUSH	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
134	1-547-558-21	FILTER BLOCK, OPTICAL	
135	1-547-540-11	LENS, ZOOM (VCL-6110WA)(TYPE I)	
135	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
351	1-547-540-11	LENS, ZOOM (VCL-6110WA)(TYPE I)	
361	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
IC901	A-7030-340-A	CCD ASSY (AUTO)(CCD IMAGER)	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M904	3-708-385-01	IRIS ASSY (TYPE I)	
M904	3-708-486-01	METER ASSY, IG (IRIS)(TYPE II)	
M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
M905	3-708-489-01	MOTOR ASSY, AF (FOCUS)(TYPE II)	
M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	
M906	3-708-487-01	MOTOR ASSY, PZ (ZOOM)(TYPE II)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	

****

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE)(UK)	
*	1-693-017-11	REMOTE COMMANDER (CAM CODER)(RMT-509)	
	3-712-673-01	SCREWDRIVER (UK)	
*	3-754-318-01	INSTRUCTION (AEP, UK)	
	3-754-385-11	MANUAL, INSTRUCTION (ENGLISH)(AEP, UK)	
	3-754-385-41	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH)(AEP)	
	3-754-385-51	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN)(AEP)	
	3-754-385-61	MANUAL, INSTRUCTION (PORTUGUESE)(AEP)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	3-754-385-71	MANUAL, INSTRUCTION (DANISH, FINNISH) (AEP)	
	3-755-132-51	MANUAL, INSTRUCTION (ENGLISH) (Australian)	
	3-941-737-01	BELT, SHOULDER	
*	3-947-110-71	INDIVIDUAL CARTON	
*	3-947-111-01	CUSHION, ACC	
*	3-947-112-01	CUSHION (LOWER)	
	3-947-500-01	LID, BATTERY CASE	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA)(UK)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E)(AEP)	
	A-6768-255-A	RFU ADAPTOR (RFU-90AS)(Australian)	
**	AC-V60A	AC POWER ADAPTOR	
***	NP-55H	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 204.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)[Note 1]	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	Flange back check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-31 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-71 board (For the video section adjustment)
	Extension cord (20P, 0.8 mm)	J-6082-169-A	For extension of VA-71 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-61 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-45, VK-22 boards) (For the video section adjustment)
	Extension cord (8P, 0.8 mm)	J-6082-173-A	For extension of cabinet L (PJ-45, VK-22 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

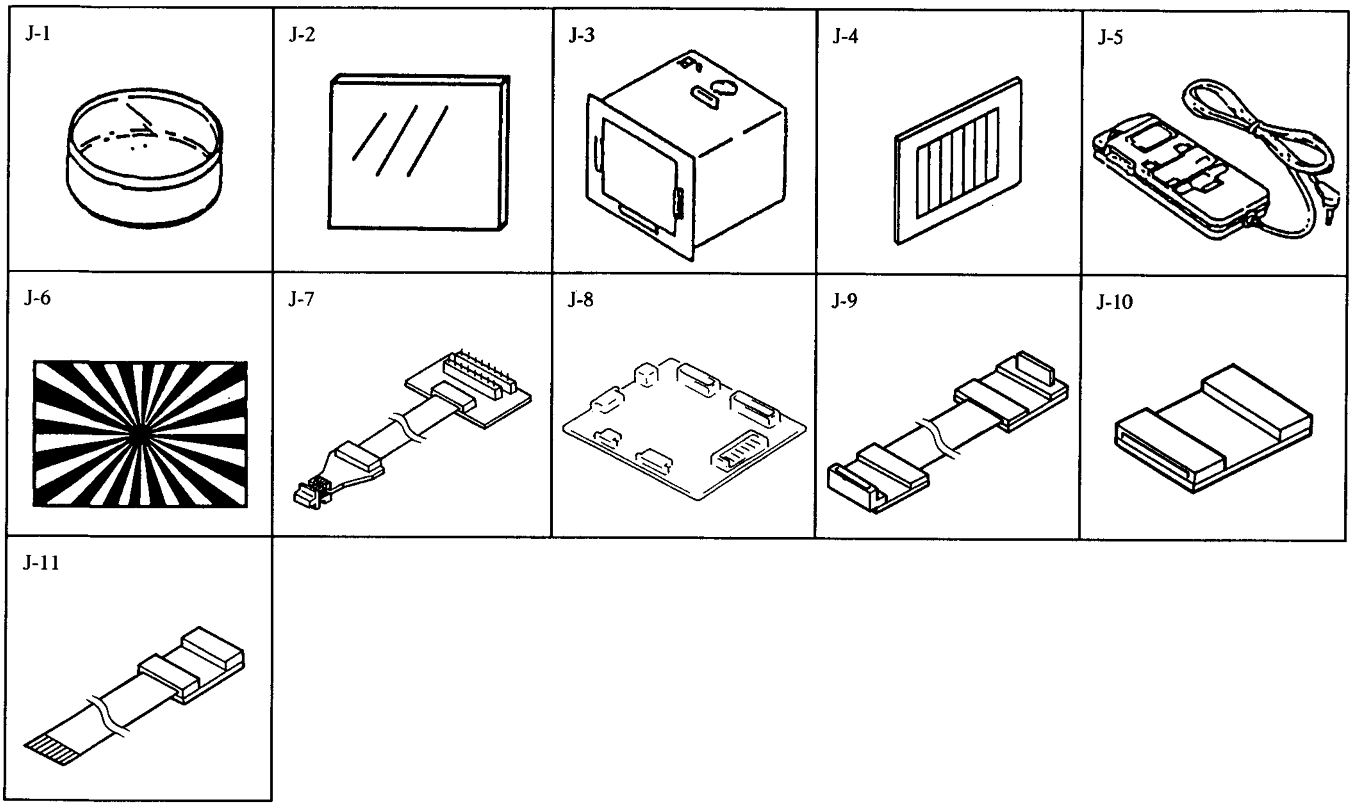

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to “1. Disassembly”.

1) Connect the equipments for adjustment as shown in Fig. 7-3.

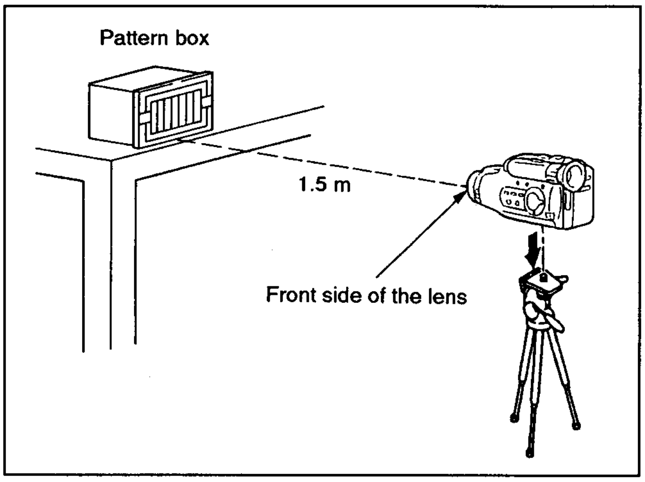

Pattern box
1.5 m
Front side of the lens

Fig. 7-2.

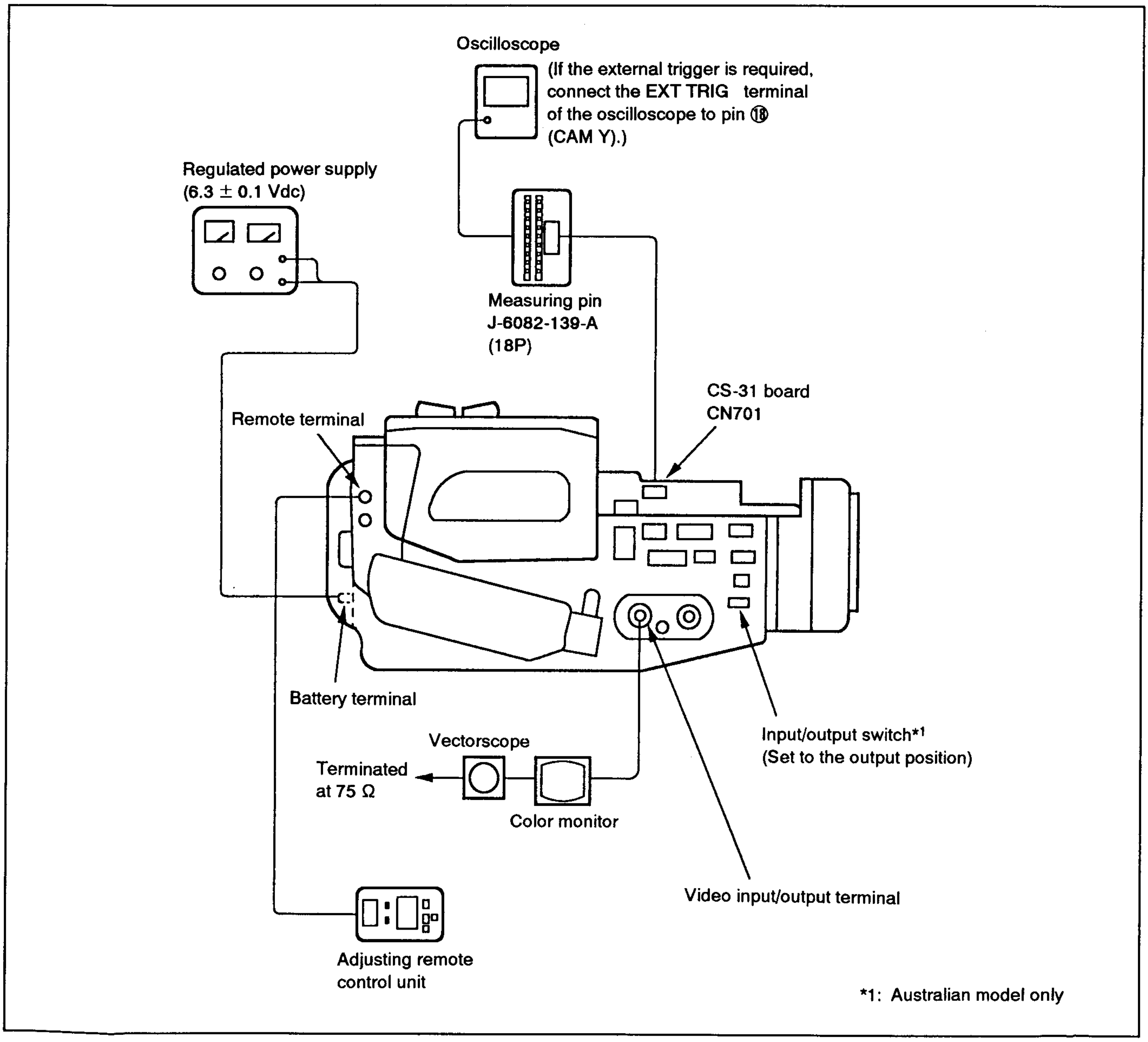

Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (CAM Y).)
Regulated power supply
(6.3 ± 0.1 Vdc)
Measuring pin
J-6082-139-A
(18P)
CS-31 board
CN701
Remote terminal
Battery terminal
Vectorscope
Terminated at 75 Ω
Color monitor
Input/output switch*1
(Set to the output position)
Video input/output terminal
Adjusting remote control unit
*1: Australian model only

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/video power switch (PK-30 board S540) ·····Camera
2. Standby switch (SW-200 board S581)··················Standby
3. AE dial (CK-47 board S560) ································ OFF
4. Input/output switchover switch (PJ-45 board S551)*1 ···Output
5. Back light button (CK-47 board S567)······················Off

*1 : Australian model only.

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

Color bar chart standard picture frame

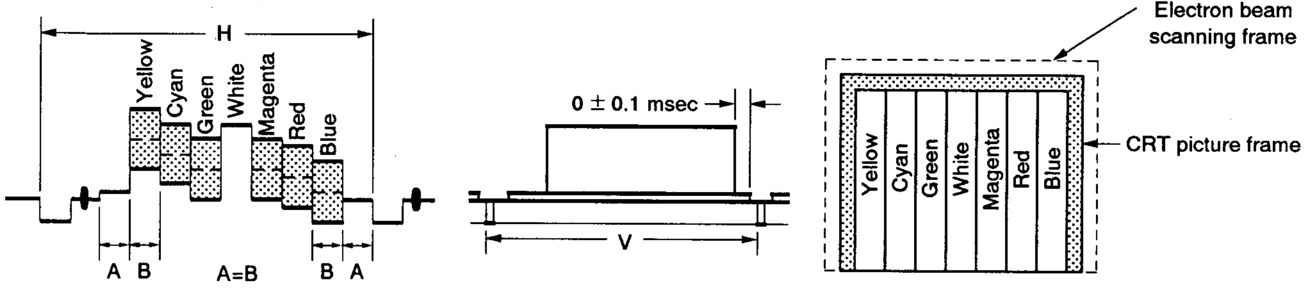

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A
0 ± 0.1 msec
V
Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

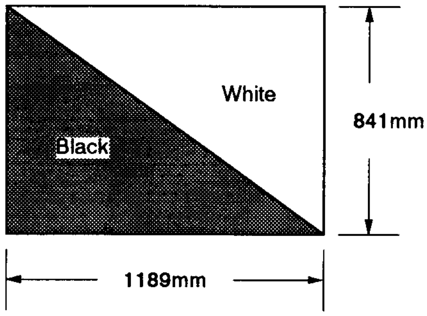

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-31 board IC702). These processes are carried out by the camera micro processor (CS-31 board IC709). This micro processor reads the data written in the non-volatile memory (CS-31 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (PS-282 board J951).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

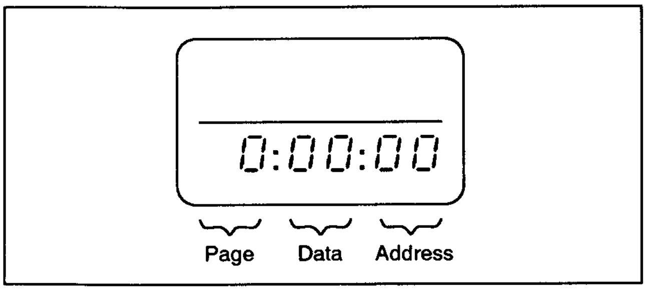


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (►►) button is pressed, and decrease when the REW (◄◄) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data will increase when the PLAY (►) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
   (To adjust the titler system (D page), adjust the data of page: 1, address: 00 to 01, and release the protect of page D.)
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>00</td><td>ID</td><td>Set ID</td><td>00</td><td>2B</td></tr>
<tr><td>01</td><td>FADER LEVEL</td><td>AE REF level modification during fader</td><td>E0</td><td>E0</td></tr>
<tr><td>02</td><td>FADER ENDTIM</td><td>The setting of the AE REF modulation time during fader</td><td>10</td><td>10</td></tr>
<tr><td>03</td><td>CS SL</td><td>Carrier balance adjustment</td><td>35</td><td></td></tr>
<tr><td>04</td><td>VSUB</td><td>CCD imager V SUB adjustment [IC702 ③]</td><td>80</td><td></td></tr>
<tr><td>05</td><td>VPGH</td><td>CCD imager VRG adjustment [IC702 ④]</td><td>80</td><td></td></tr>
<tr><td>06</td><td>VREF Y</td><td>Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]</td><td>7B</td><td></td></tr>
<tr><td>07</td><td>VREF C</td><td>Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]</td><td>99</td><td></td></tr>
<tr><td>08</td><td>HALL GAIN</td><td rowspan="2">Hole amplifier gain adjustment [IC702 ⑦]
Hole amplifier offset adjustment [IC702 ⑧]
} HALL adjustment</td><td>47</td><td></td></tr>
<tr><td>09</td><td>HALL OFFSET</td><td>71</td><td></td></tr>
<tr><td>0A</td><td>E LOWLIGHT START</td><td>Low luminance intensity REF level modulation start setting</td><td>30</td><td>30</td></tr>
<tr><td>0B</td><td>REF 2V</td><td>2V standard voltage for hole element [IC702 ⑫]</td><td>68</td><td>68</td></tr>
<tr><td>0C</td><td>AD REF</td><td>Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]</td><td>72</td><td></td></tr>
<tr><td>0D</td><td>CORE DETH</td><td>CCD correction control</td><td>04</td><td>04</td></tr>
<tr><td>0E</td><td>CORE VTR DELAY</td><td>1HDL longitudinal setting during VTR playback</td><td>16</td><td>16</td></tr>
<tr><td>0F</td><td>CORE APCN4</td><td>Horizontal aperture setting</td><td>A5</td><td>A5</td></tr>
<tr><td>10</td><td>CORE APCN5</td><td>Vertical aperture setting</td><td>3D</td><td>3D</td></tr>
<tr><td>11</td><td>CORE EFECT</td><td>Special effect control</td><td>A8</td><td>A8</td></tr>
<tr><td>12</td><td>CORE MATR</td><td>BLUE matrix constant</td><td>27</td><td>27</td></tr>
<tr><td>13</td><td>CORE MATB</td><td>RED matrix constant</td><td>6C</td><td>6C</td></tr>
<tr><td>14</td><td>CORE BURST LEVEL</td><td>Burst flag level setting, color modulation ON/OFF<table><tr><th>Data</th><th>Adjustment modeAdjustment</th></tr><tr><td>38</td><td>Normal level</td></tr><tr><td>2E</td><td>Color modulation stopped</td></tr></table></td><td>38</td><td>38</td></tr>
<tr><td>15</td><td>CORE CHROMA DLY</td><td>Y/C delay adjustment</td><td>03</td><td>03</td></tr>
<tr><td>16</td><td>CORE Y SETUP</td><td>Set up level setting</td><td>03</td><td>03</td></tr>
<tr><td>17</td><td>CORE VHAPCN</td><td>Slice and level setting of the aperture signal</td><td>17</td><td>17</td></tr>
<tr><td>18</td><td>CORE B-Y GAIN</td><td rowspan="4">B–Y GAIN
R–Y GAIN
R–Y HUE
B–Y HUE
} Color reproduction adjustments</td><td>13</td><td></td></tr>
<tr><td>19</td><td>CORE R-Y GAIN</td><td>11</td><td></td></tr>
<tr><td>1A</td><td>CORE R-Y HUE</td><td>FF</td><td></td></tr>
<tr><td>1B</td><td>CORE B-Y HUE</td><td>FD</td><td></td></tr>
<tr><td>1C</td><td>CS/APCCUT</td><td>Low luminance intensity aperture and chroma suppress level</td><td>22</td><td>22</td></tr>
</table>

Table 7-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient		66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient		18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value		C2	C2

Table 7-2 (2).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
4A	AWB BOTTOM DWN	AWB incoming frame bottom lower value	94	94
4B	AWB MIDDLE UP	AWB incoming frame middle upper value	AD	AD
4C	AWB MIDDLE DWN	AWB incoming frame middle lower value	96	96
4D	AWB TOP UP	AWB incoming frame top upper value	78	78
4E	AWB TOP DWN	AWB incoming frame top lower value	60	60
4F	AWB KEIKO	AWB incoming frame fluorescent light output lower value	6C	6C
50	AWB KEIKO DWN	AWB incoming frame fluorescent light lower value	5C	5C
51	AWB R TOP LMT	AWB incoming frame Rcont upper value	6E	6E
52	AWB R DWN LMT	AWB incoming frame Rcont lower value	20	20
53	AWB B TOP LMT	AWB incoming frame Bcont upper value	83	83
54	AWB B IN TOP	AWB incoming frame Bcont	67	67
55	AWB B IN MAX	AWB incoming frame Bcont	5C	5C
56	AWB B OUT MIN	AWB incoming frame Bcont	5C	5C
57	AWB B OUT DWN	AWB incoming frame Bcont	4A	4A
58	AWB B DWN LMT	AWB incoming frame Bcont lower value	1B	1B
59	AWB LL LMT	Low luminance intensity limiter	06	06
5A	AWB T M DIVID	AWB incoming frame upper, middle border value	5B	5B
5B	AWB B M DIVID	AWB incoming frame middle, lower border value	39	39
5C	AWB DELAY TM	AWB tracking speed Data | Adjustment mode 01 | High speed tracking mode 0A | Normal	0A	0A
5D	AWB FAST TM	AWB initial high speed tracking amount	40	40
5E	AWB OUT HYS OFF	AWB outdoor hysteresis off difference	0C	0C
5F	AWB OUT B HYS	AWB outdoor hysteresis amount	06	06
60	AWB MODE	AWB adjustment mode Data | Adjustment mode 00 | Normal D0 | AWB adjustment mode F1 | Sampling display mode	00	00
61	AE REFL	Reference value (lower) for AE	00	00
62	AE REFH	Reference value (upper) for AE	18	18
63	AGC MIN	AGC MIN value (AGCREF value), IRIS level adjustment	E3	
64	AE MIML	Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment	32	
65	AE MAXL	High luminance intensity side limiter (lower)	80	80
66	IRIS OFFSET	Iris ROM table OPEN side off set	D0	D0
67	AE KEISU	Correction coefficient during detection weighting	00	00
68	AE FUNCTION	SW for turning each AE function ON and OFF	02	02
69	BL HOSEIH	Forcible back light level setting (upper)	40	40
6A	JITEISU DOWN	Constant during loop response DOWN side	28	28
6B	JITEISU UP	Constant during loop response UP side	0D	0D
6C	AE KNEE	KNEE setting value for AE	FF	FF
6D	ORETEN SET	Variable point due to time constant error amount	13	13

Table 7-2 (3).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (Lower)	80	80
82	IRIS MIN H	Iris limit value for small iris (Upper)	02	02
83	DELTA SHUTGAIN	Smoothing amount setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) Flange back adjustment	00	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	00	
88	TELE LIMIT	ZOOM limiter TELE (lower)	00	
89	TELE SIMITH	ZOOM limiter TELE (upper)	04	
8A	STEP ZERO	Flange back value	80	
8B	STEP ZERO SPAN (VAP ONLY)	Flange back value 2	00	00
8C	ZOOM SPD FAST	Zoom speed (fast)	1C	1C
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	89	89
8E	ZS INIT SLOW	Zoom speed initial value (slow)	89	89
8F	ZS INIT FAST	Zoom speed initial value (fast)	F0	F0
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	12	12
92	ZS L	Zoom servo coefficient L	02	02
93	ZP HYS	Zoom potential hysteresis	05	05
94	MOTOR ABILITY	Step motor MAX SPEED	08	08
95	AF MD2THL	MODE2 THR	20	20
96	MAXCHG THR	MAX value renewal THR	1A	1A
97	ERR THL	Wobbling width THR	18	18
98	WOB INTV	Wobbling second interval	04	04
99	ERRPOL THR	MODE2 error possible THR	13	13

Table 7-2 (4).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>80</td><td>80</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>F0</td><td>F0</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>00</td><td>00</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>72</td><td>72</td></tr>
<tr><td>A2</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>D2</td><td>D2</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>03</td><td>03</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>10</td><td>10</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>10</td><td>10</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>80</td><td>80</td></tr>
<tr><td>A7</td><td>FB FOCUSZERO</td><td>Constant for flange back adjustment</td><td>D8</td><td>D8</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>05</td><td>05</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>08</td><td>Zoom, Focus fixed</td></tr>
<tr><td>00</td><td>Normal</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MOD</td><td>Flange back adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Nomal</td></tr>
<tr><td>01</td><td>Flange back adjustment</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>ELENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>23</td><td>23</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table>
<tr><th>Data</th><th>DDS display mode</th></tr>
<tr><td>00</td><td>Y sampling display</td></tr>
<tr><td>03</td><td>R–Y, B–Y display</td></tr>
<tr><td>40</td><td>HALL data display</td></tr>
<tr><td>82</td><td>R ratio display</td></tr>
<tr><td>83</td><td>b ratio display</td></tr>
<tr><td>91</td><td>R.B ratio (M) display</td></tr>
<tr><td>B0</td><td>Focus step display</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>B0</td><td>CORE OTHER</td><td></td><td>10</td><td>10</td></tr>
<tr><td>B1</td><td>CORE YGAIN</td><td>Core field data 0 byte gain</td><td>3A</td><td>3A</td></tr>
<tr><td>B2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B4</td><td>ZOOM DROP 1</td><td>F-No. dropping (1) by zoom lens</td><td>00</td><td>00</td></tr>
<tr><td>B5</td><td>ZOOM DROP 2</td><td>F-No. dropping (2) by zoom lens</td><td>95</td><td>95</td></tr>
</table>

Table 7-2 (5).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B6				
B7				
B8				
B9				
BA	AWB in B hys	AWB indoor hysteresis amount (B)	04	04
BB	AWB in R hys	AWB indoor hysteresis amount (R)	02	02
BC				
BD				
BE	MF STEP CHNGE	MODE 2 THR coefficient	06	06
BF	ZOOM SPEED SUPER SLOW	Zoom speed (Super slow speed)	08	08
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	89	89
C1	AF CONTROL FLAG		2C	2C
C2	AE Y THR	Low luminous intensity AE Y THR1	40	40
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	18
C4	MD2 SPD	Focus speed at MODE 2	41	41
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	30	30
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	10	10
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01	Camera adjustment mode (window OFF), F page write protect released
		10	Normal
		11	Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00	Normal
		01	IRIS OPEN, AGC HOLD
		03	IRIS CLOSE1, AGC HOLD
		05	IRIS CLOSE2, AGC MIN
		07	IRIS CLOSE3, AGC MAX
		09	ND0.5 SHUTTER (PAL=1/160, NTSC=1/190)
		0B	ND0.8 SHUTTER (PAL=1/320, NTSC=1/380)
		0D	AWB PRESET1: 3200K PRESET DATA take in
		0F	WB 3200K PRESET: Indoor white balance mode
		11	AWB PRESET2: 3200K PRESET DATA take in
		13	ZOOM HUNTING1 ZOOM SPDSLOW
		15	ZOOM HUNTING2 ZOOM SPDFAST
		1F	EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00	NTSC=1/60, PAL=1/50
		15	NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00	Normal
		01	ZOOM speed SLOW (10 second)
		02	ZOOM speed FAST (3.5 second)
		03	ZOOM speed SLOW (10 second)
09 ★	COMPLEATED FLAG	00	Camera Adjustment not completed
		01	Camera adjustment completed
11 ★	ROM VERSION	01	Camera micro processor ver1
		02	Camera micro processor ver2, ver3
		04	Camera micro processor ver4

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-31 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	$\overline{\text{CS ROM}}$	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

The lower digits of the hexadecimal notation / The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① **B (b)**	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-282 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
–9V check	
Measurement point	Pin ⑫ of CN950
Specified value	–8.5 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
3) Set data: 1F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data is different from the initial data for adjustment. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	2B
14 (CORE BURST LEVEL)	38
15 (CORE CHROMA DLY)	03
16 (CORE Y SETUP)	03
5C (AWB DELAY TM)	0A
68 (AE FUNCTION)	02
6A (JITEISU DOWN)	28
6B (JITEISU UP)	0D
8C (ZOOM SPD FAST)	1C
8D (ZOOM SPD SUPER)	89
8E (ZS INIT SLOW)	89
8F (ZS INIT FAST)	F0
94 (ZOOM SPD SLOW)	08
9E (ZOOM PULSE LIMIT)	F0
AE (NTSC PAL/H DEF DELAY)	23
B0 (CORE OTHER)	10
B1 (CORE Y GAIN)	3A
BF (ZOOM SPEED SUPER SLOW)	08
C0 (ZOOM INT SUPER SLOW)	89

[Distinguishing the Camera Micro Computer (IC709) Versions]

The camera micro computer version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.5	CXP80624-299Q	05

4. 28 MHz Original Oscillation Adjustment (CS-31 board)

Subject	Not required
Measurement Point	CL821 (pin (57) of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14187500 ± 71 Hz

Adjusting method:

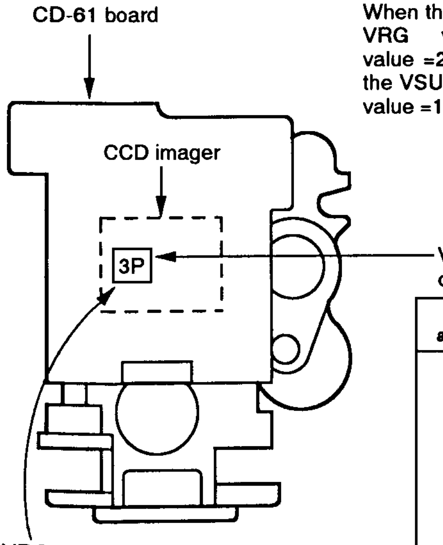
1) Use CT801 to adjust the oscillation frequency to 14187500 ± 71 Hz.

5. V SUB Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-7.

6. VRG Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of PS-282 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-282 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 TO 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).
    $A'=W_2'+K_1'-W_1'-K_2'$ ··························Equation 1
    $B'=W_1'-K_1'$ ··Equation 2
    $X_1'=\dfrac{2048+(48\times A')-(16\times B')}{A'}$ ················Equation 3
14) Convert X_1' to hexadecimal notation, and obtain X_1.
    (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to decimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).
    $C'=W_0'-B'-51$ ···································Equation 4
    $X_2'=\dfrac{(128-B')\times(X_1'-48)+48\times C'}{C'}$ ············Equation 5
    (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
    (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1m from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H), 8A (STEP ZERO)

Adjusting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
4) Release the protect.
   Page: 6, address: 00, data: 01
5) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
6) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
7) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
8) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2=D_1 \pm 5$ $D_4=D_3 \pm 5$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
2) Set data: B0 to page: F, address: AF. (Focus step display mode)
3) Place the Siemens star 1m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
5) Turn off the auto-focus.

- Checking the flange back at the center point of the zoom.

6) Shoot the Siemens star with the zoom TELE end.
7) Rotate the focus ring, and adjust the focus.
8) Adjust to the center point of the zoom.
   (Adjust to the center point by viewing the EVF zoom position.)
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and take the value as D_2.
11) Check that $D_2=D_1 \pm 5$.

- Checking the flange back at the zoom WIDE end.

12) Shoot the Siemens star at the zoom TELE end.
13) Rotate the focus ring, and adjust the focus.
14) Adjust to the zoom WIDE edge.
15) Read the focus step value displayed on the TV monitor, and take the value as D_3.
16) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and adjust to D_4.
17) Check that $D_4=D_3 \pm 5$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=150 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

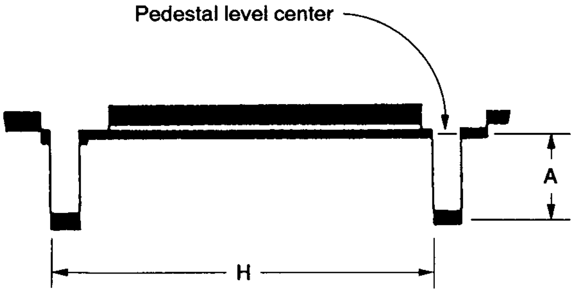


Fig. 7-8.

12. BURST Level Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=150 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

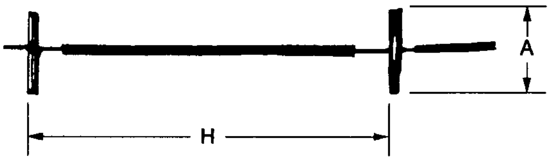


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Sets the SET UP level to 0)
5) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
6) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
   (Set the data of address 0C to the maximum value satisfying the specification.)
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 03 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Returns the SET UP level to the normal level.)
2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

The center of the black luminance point should be within this circle

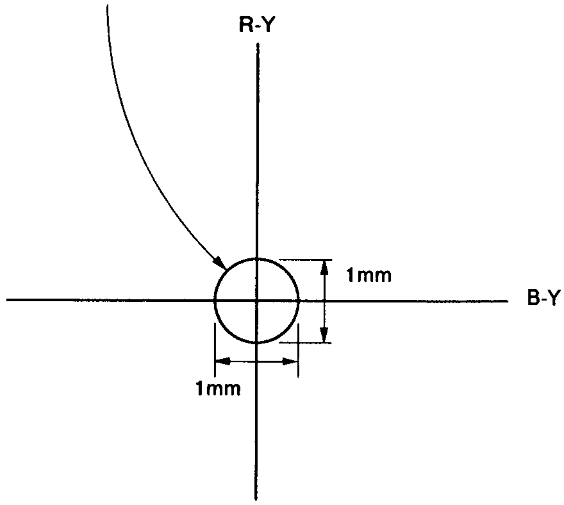


Fig. 7-10.

15. Picture Frame Setting

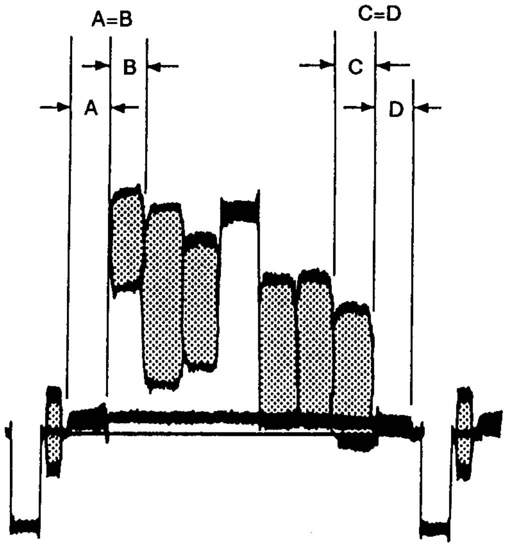
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

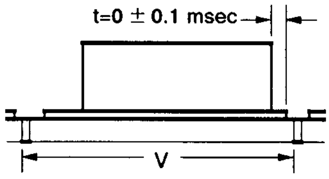


Fig. 7-11.

Check on the TV monitor

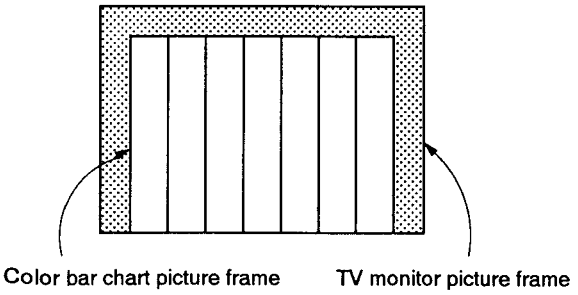


Fig. 7-12.

16. IRIS Level Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=200 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

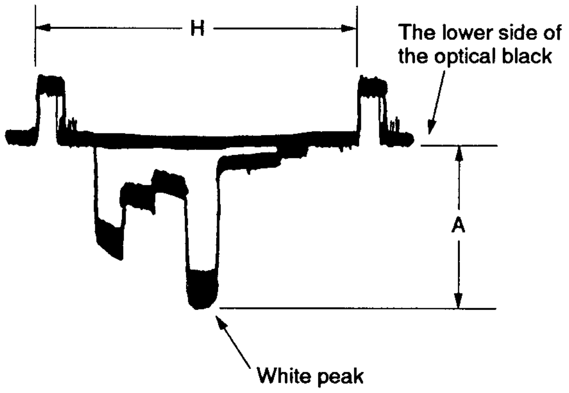


Fig. 7-13.

17. MAX GAIN Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=210 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

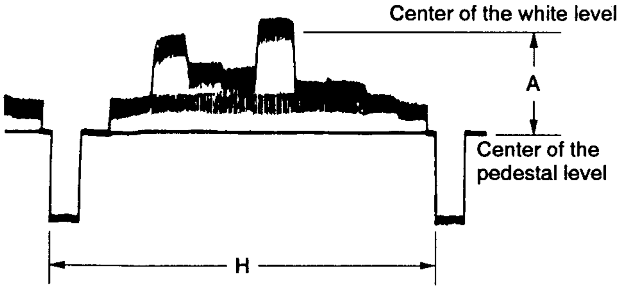


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point Measuring Instrument	DDS display of the EVF or TV monitor
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D3A.
8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

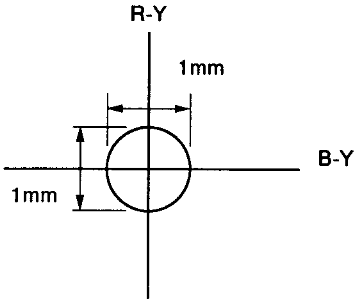


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B-Y GAIN), 19 (CORE R-Y GAIN), 1A (CORE R-Y HUE), 1B (CORE B-Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
2) Set data: 01 to page: 6, address: 00.
   (Camera adjustment mode (Window OFF) setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

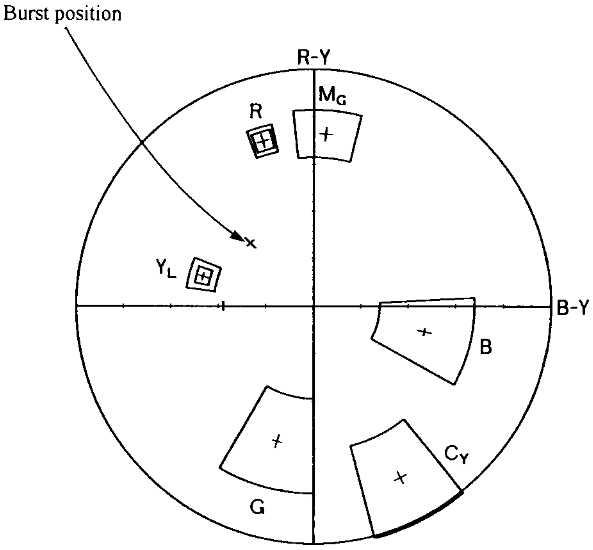


Fig. 7-16.

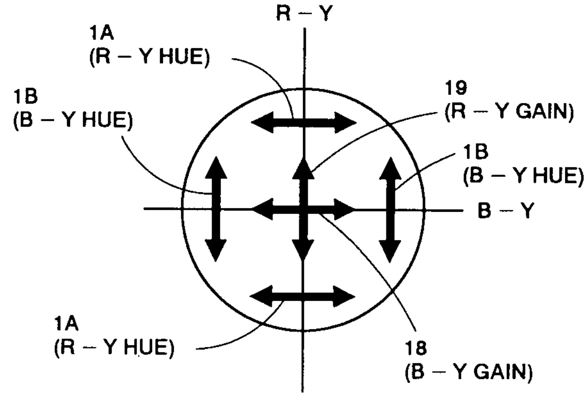


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 3O (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2980 ± 40 B ratio 5C80 ± 40

Note: Check that "Auto white balance preset adjustment" has been completed.

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
3) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40.
5) Press the PAUSE button of the adjusting remote control unit.
6) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5C80 ± 40.
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
   (Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R, B ratio (M) display mode setting)
8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
10) Place the C14 filter on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
    (Auto white balance outdoor mode check)
12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
    (Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 0A to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance fast tracking mode)
2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R, B ratio (M) display mode)
3) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

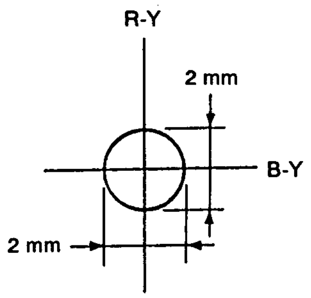


Fig. 7-18. A

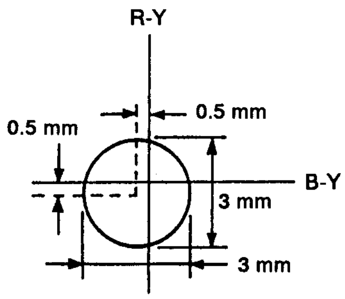


Fig. 7-18. B

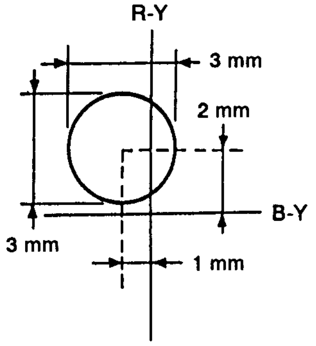


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Check that the data of page: 6, address: 01 is 00.
   2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y•B–Y data display mode setting)
6) Read the average value of the DDS display R–Y data (Note 2), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Read the average value of the DDS display B–Y data (Note 2), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: B6 to page: 1, address: E7.
11) Read the average value of the DDS display R–Y data (Note 2), and set to Y_2.
12) Convert Y_1, R_1, Y_2 to decimal notation to obtain Y_1', R_1' and Y_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
13) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1'=Y_2'-Y_1'$
14) Calculate D3D from the following table
    (D3D is hexadecimal notation)

X_1' value	**D3D**
$-1 \leqq X_1' \leqq 1$	F0
$X_1'>1$	F1
$X_1'<-1$	FF

15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
16) Specifying the Red position
    1. Set data: 59 to page: 1, address: E6.
    2. Set data: 6D to page: 1, address: E7.
17) Read the average value of the DDS display B–Y data (Note 2), and set to R_2.
18) Convert R_2 to decimal notation to obtain R_2'.
19) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2'=R_2'-R_1'$
20) Calculate D3E from the following table.

X_2' value	**D3E**
$X_2' \geqq 0$	00
$0>X_2' \geqq -1$	01
$-1>X_2'$	02

21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 38 to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y•B–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: As the R–Y data and B–Y data are displayed alternatively, it will be difficult to distinguish between the R–Y data and the B–Y data.
Record this data on a tape, and perform frame advancing playback so that only the R–Y data or the B–Y data is read.
(Example)
If the frame advancing playback is performed, the following will be displayed.

$$63\underline{88} \rightarrow \underline{8B}61 \rightarrow 61\underline{8B} \rightarrow \underline{8A}63 \rightarrow$$
$$65\underline{89} \rightarrow \underline{8B}60 \rightarrow 60\underline{8A} \rightarrow \underline{89}63$$

As the R–Y data is above 80, and the B–Y data is below 7F, the data which is underlined is the R–Y data.
If the average value is calculated, the R–Y data will become 8A and the B–Y data will becames 62.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 40 mV SYNC level=300 ± 20 mV BURST level=300 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

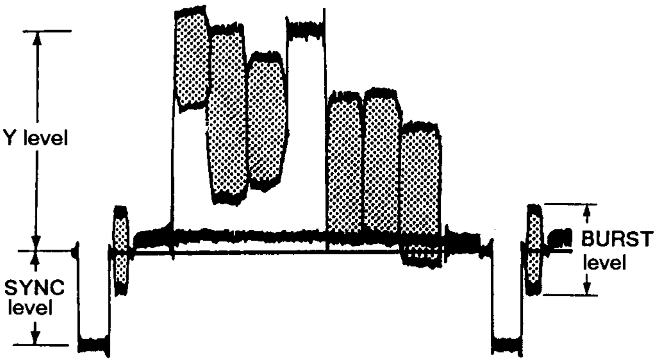


Fig. 7-19.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-21.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-20.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

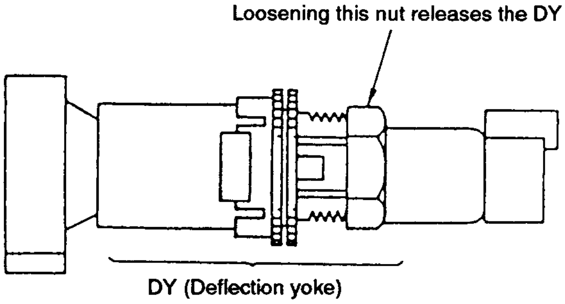
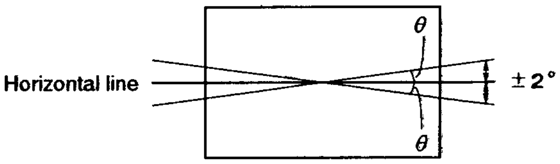


Fig. 7-20.



Specified value: Image orientation within ± 2° of horizontal line.

Fig. 7-21.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-23.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-22.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

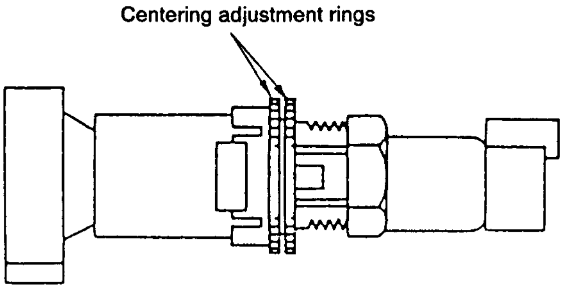
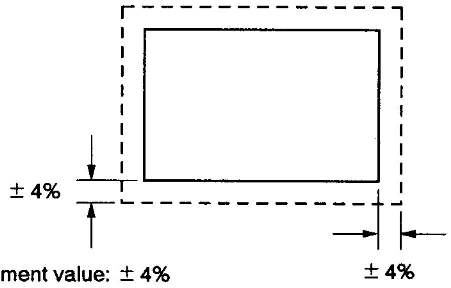


Fig. 7-22.



Adjustment value: ± 4%

Fig. 7-23.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.3 ± 0.1 Vdc

Adjustment method:

1) Adjust RV504 (AFC) for 2.3 ± 0.1 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-25.)

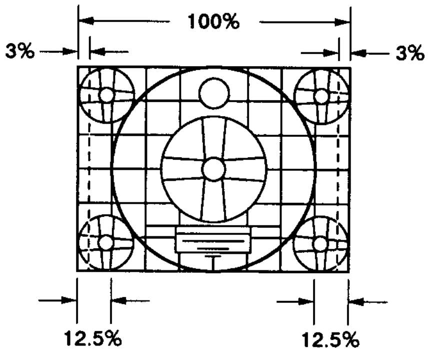
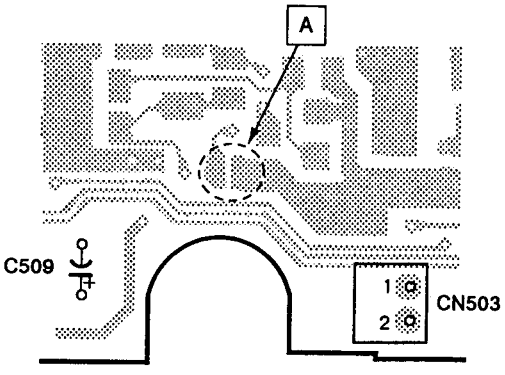


Fig. 7-24.



VF-44 BOARD (COMPONENT SIDE)

A section	H size
Short	Large
Open	Small

Fig. 7-25.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	6 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 6 ± 3% (upper and lower total).

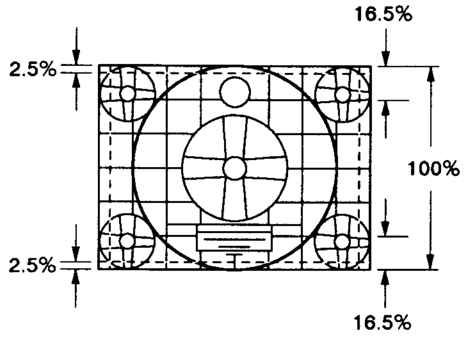

16.5%
2.5%
100%
2.5%
16.5%

Fig. 7-26.

7-3-6. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

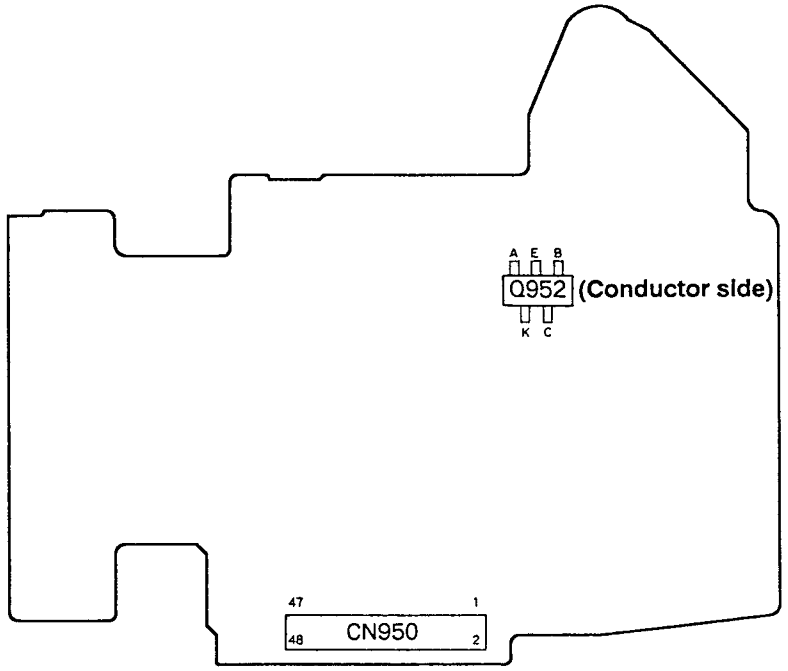
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

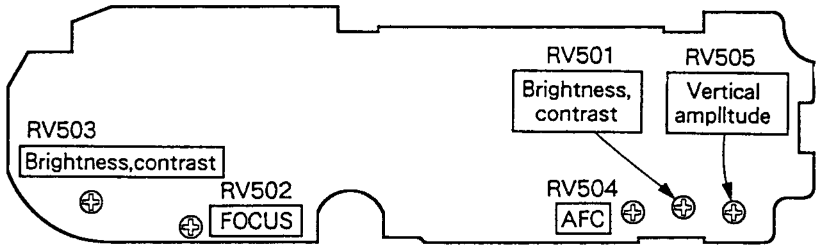
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

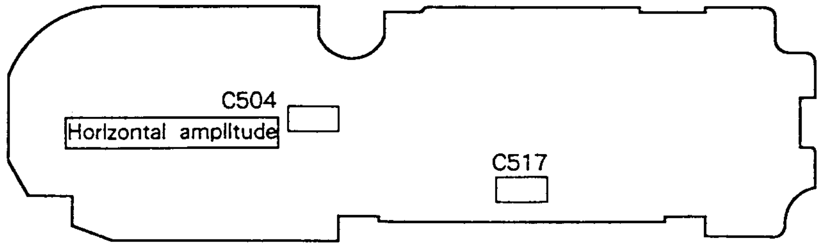
PS-282 BOARD (COMPONENT SIDE)


A E B
Q952
(Conductor side)
K C
47
1
48
CN950
2

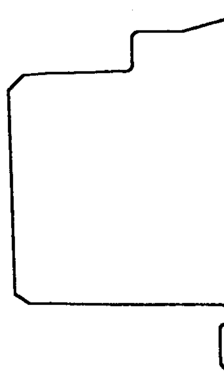
VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

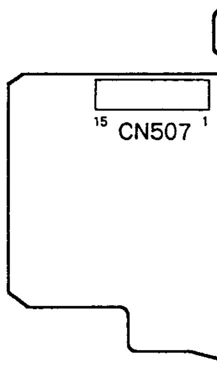
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

CS-31 BOARD (C

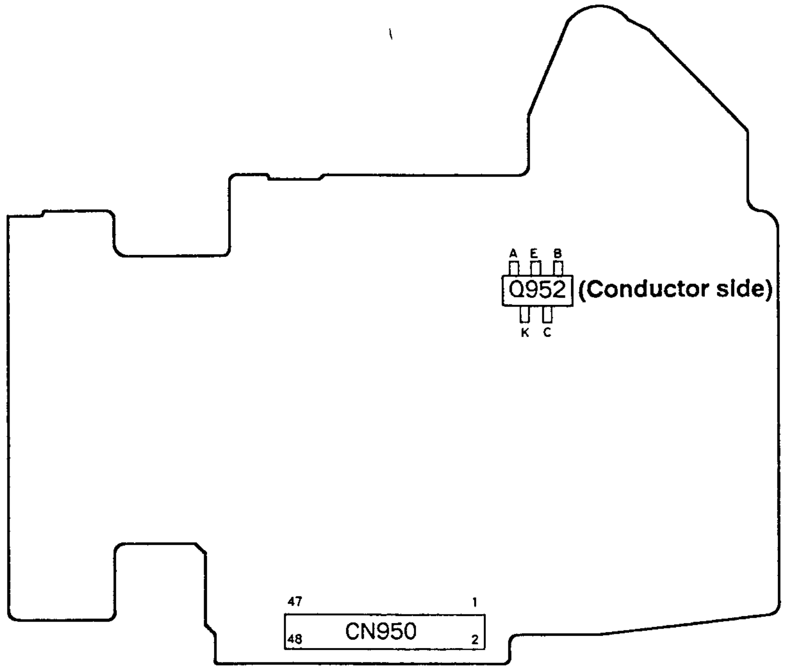


CS-31 BOARD (C

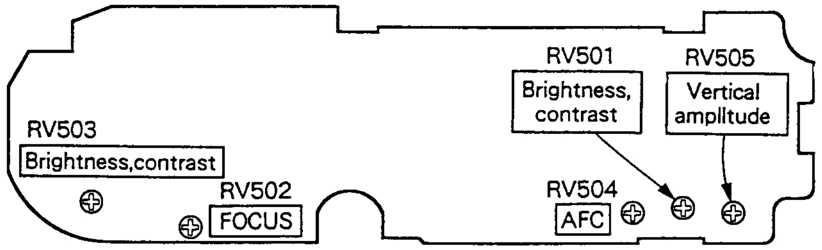


7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

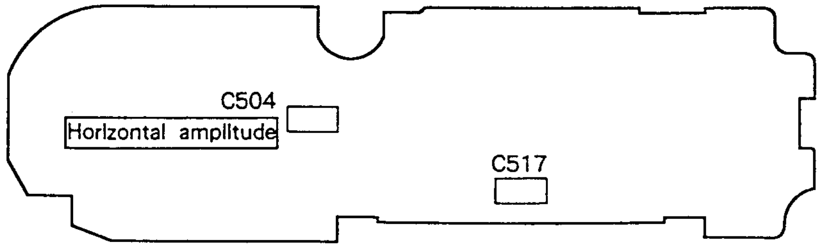
PS-282 BOARD (COMPONENT SIDE)


A E B
Q952
(Conductor side)
K C
47
1
48
CN950
2

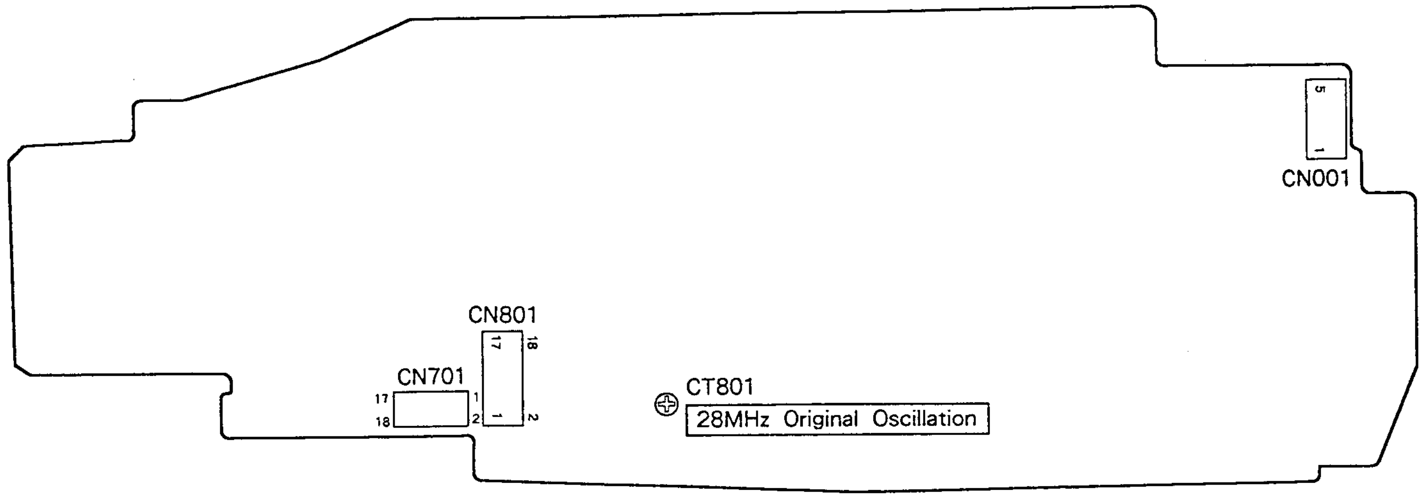
VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

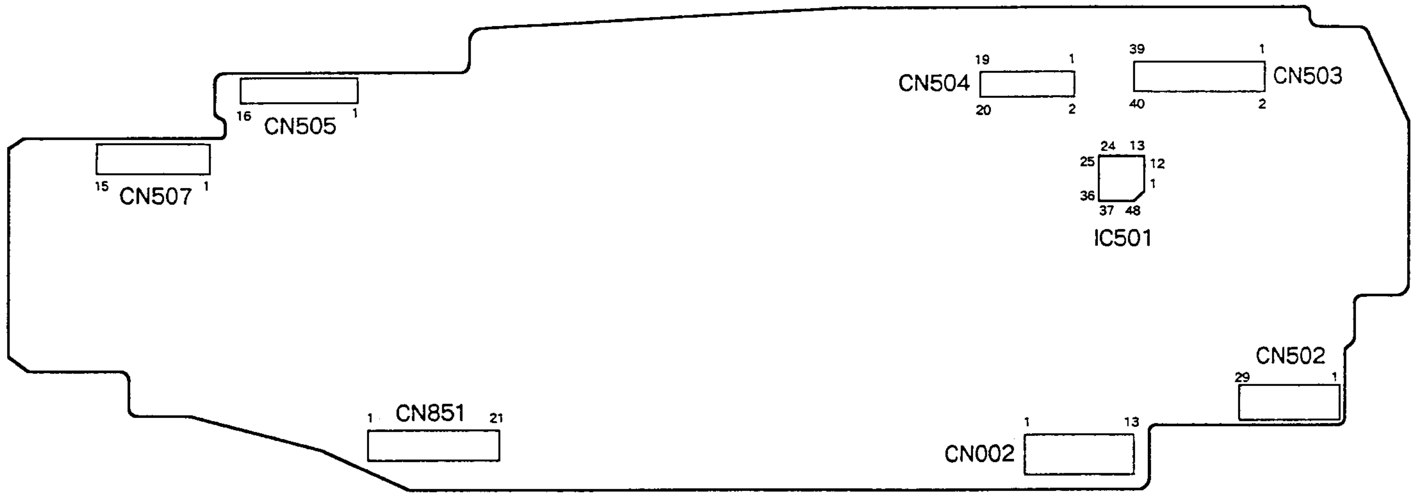
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

CS-31 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17
18
CN701
17
18
1
2
1
2
CT801
28MHz Original Oscillation

CS-31 BOARD (CONDUCTOR SIDE)


19
1
CN504
20
2
39
1
CN503
40
2
16
CN505
1
15
CN507
1
24 13
25
12
1
36
37 48
IC501
CN502
29
1
1
CN851
21
1
13
CN002

SECTION 8

MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

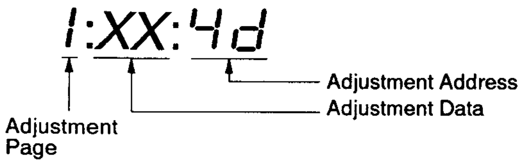
Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)
For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.
   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1: CS-31 board CN001 pin ③ (PB RF)
   CH2: CS-31 board CN001 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1CP: 8-967-995-07).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

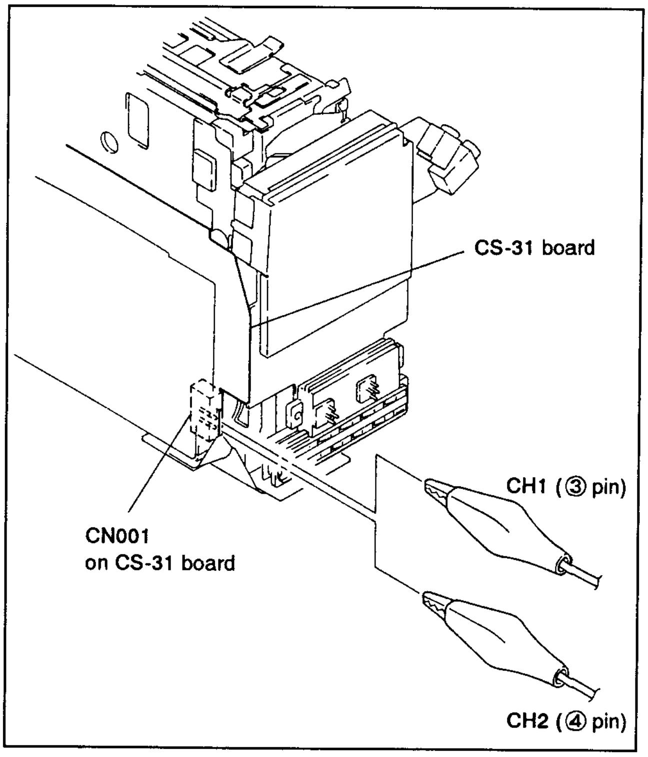


Fig.8-1.

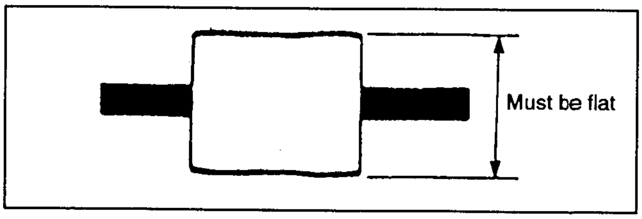


Fig.8-2.

SECTION 9
VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 238.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

9-1-1. Equipments to be used

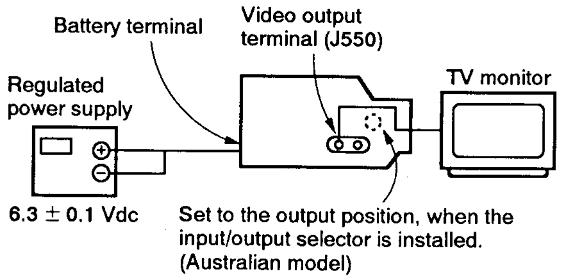
1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1CP)
    Part Code: 8-967-995-07
    For video frequency characteristics adjustment (WR5-6C)
    Part Code: 8-967-995-17
    For checking operations
    (WR5-4CL)[Note 1]
    Part Code: 8-967-995-56
    (WR5-5CSP)[Note 2]
    Part Code: 8-967-995-47
    Note: The following alignment tapes can also be used.
    1) WR5-3CL (8-967-995-36)
    2) WR5-4CSP (8-967-995-46)
12) Remote control unit for adjustment (J-6082-053-A)
13) VA-71 board extension cord (20P, 0.8 mm)
    Part Code: J-6082-169-A
14) VA-71 board extension cord (40P, 0.8 mm)
    Part Code: J-6082-168-A
15) Mecha deck extension cord (30P, 0.8 mm)
    Part Code: J-6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/video (or player) power switch ······· Position of the video (or player)
- Connect the adjusting remote control unit to the remote terminal (PS-282 board J951).

- Connect the regulated power supply and TV monitor as follows.


Battery terminal
Video output terminal (J550)
Regulated power supply
TV monitor
6.3 ± 0.1 Vdc
Set to the output position, when the input/output selector is installed. (Australian model)

- Connect the pattern generator as follows.
  Connect pin ④ of CN507 on CS-31 board to GND with a jumper wire.
  After adjusting, be sure to disconnect this wire.

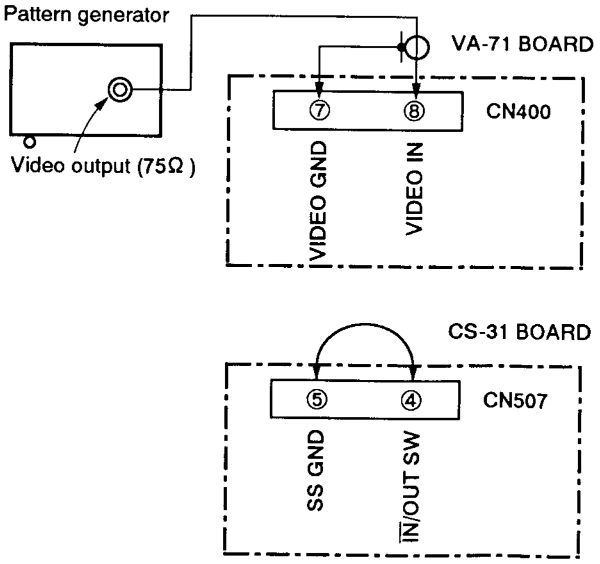

Pattern generator
Video output (75Ω)
VA-71 BOARD
⑦
⑧
CN400
VIDEO GND
VIDEO IN
CS-31 BOARD
⑤
④
CN507
SS GND
IN/OUT SW

Fig. 9-1.

9-1-3. Precautions upon adjustment

The MA-93 board (Mic amplifier) is not required for adjusting the video section. Disconnect CN571 (8 pins) on VK-22 board.

- Remove the following connector if the focus ring gets in the way.
  1. CN852 of CS-31 board (8 pins)

- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
  1. CN801 of the CS-31 board (18 pins)
  2. CN851 of the CS-31 board (20 pins)
  3. CN902 of the CD-61 board (5 pins)

- Use an extension cable when opening the VA-71 board.
  1. Between CN201 of VA-71 board and CN503 of CS-31 board.
     40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
  2. Between CN202 of VA-71 board and CN504 of CS-31 board.
     20 pins, 0.8 mm pitch extension cable (J-6082-169-A)

- Use an extension cable when opening the CS-31 board, and when checking the operation of the mechanical section.
  1. Between CN502 of CS-31 board and FP-600 board.
     30 pins, 0.8 mm pitch extension cable (J-6082-167-A)

- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
  1. CN505 of the CS-31 board (16 pins)

[How to set the forced POWER ON mode]

1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/VTR (or player)) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.
Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]

1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00.
   (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-4. How to Set the REC Mode in the Model without REC Switch

1. REC key forbidden accept mode cancel
   1. Connect the adjustment remote controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on the HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01.
      (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 8F.
      (REC key forbidden accept mode cancel)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

The REC key is accepted through the above procedure. The adjustment remote controller may be removed, hereafter.

2. REC mode setting
   1. Connect Pin ⑭ of CN507 (KEY IN 1) and Pin ⑨ of CN507 (KEY OUT 3) on CS-31 board with a jumper wire until the VTR is set to REC mode.

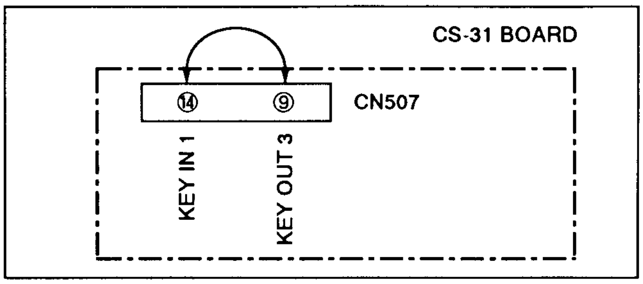


Fig. 9-2.

3. Procedure after completed the adjustment
   Be sure to return the mode to REC key forbidden accept mode after adjustment.
   1. Connect the adjustment remoter controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01.
      (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 8E.
      (Setting of the REC key forbidden accept mode)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ⑧ of CN400 on the VA-71 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

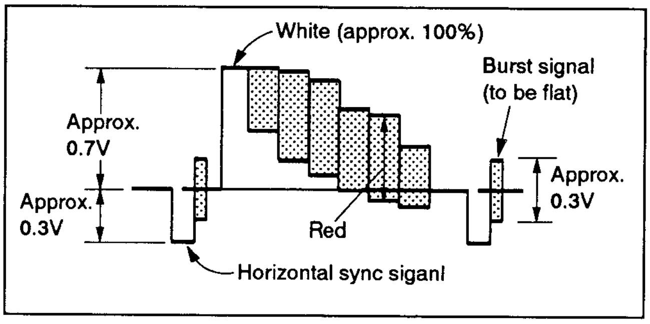


Fig. 9-3. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment.

If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record-ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1CP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6C	L	MP	LP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5CSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. 400 Hz 20 sec. } Color bar section 14 kHz 20 sec. Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4CL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		

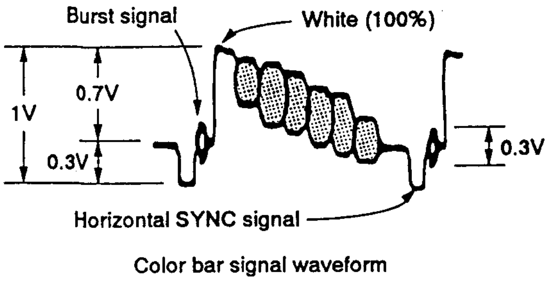
Note: Recording mode
L ·············· Conventional mode
E ·············· hi8 (hi band) mode

Tape type
MP············ Particle type metal tape
ME············ Evaporated type metal tape

Table 9-1.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure at the video output terminal (Terminated at 75 Ω)


Burst signal
White (100%)
1V
0.7V
0.3V
0.3V
Horizontal SYNC signal
Color bar signal waveform

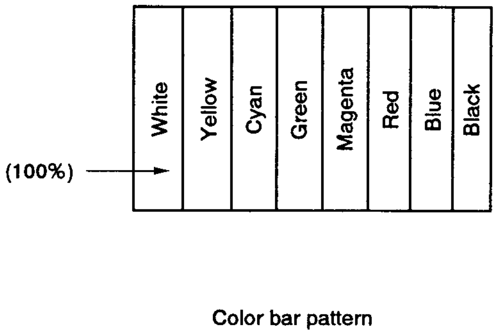

White
Yellow
Cyan
Green
Magenta
Red
Blue
Black
(100%)
Color bar pattern

Fig. 9-4. Alignment tape color bar signal

9-1-7. Input/Output Level and Impedance

1. Australian model

[I/O level and Impedance]

Video input/output	phone jack Input signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio input/output	phone jack Input level: –7.5 dBs (0 dBs=0.775 Vrms) Input impedance: More than 47 kΩ Output level: –7.5 dBs (at output impedance 47 kΩ) Output impedance: More than 2.2 kΩ

2. AEP, UK model

[I/O level and Impedance]

Video output	phone jack Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio output	phone jack Specified output: –7.5 dBs Output impedance: More than 2.2 kΩ

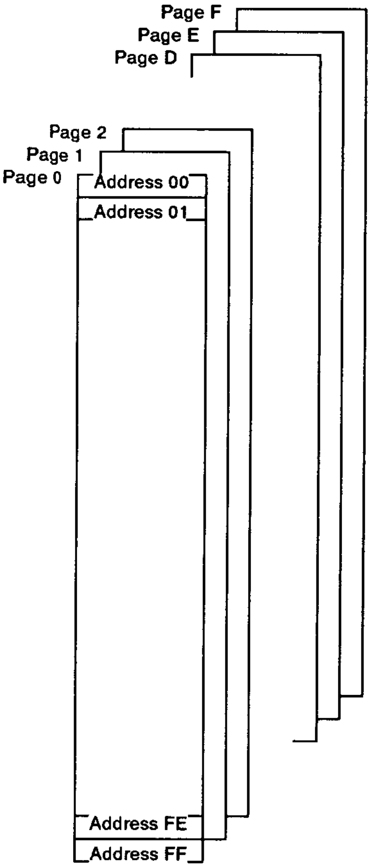
9-1-8. Service Mode

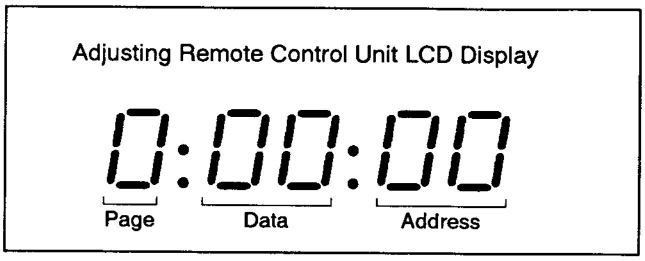
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

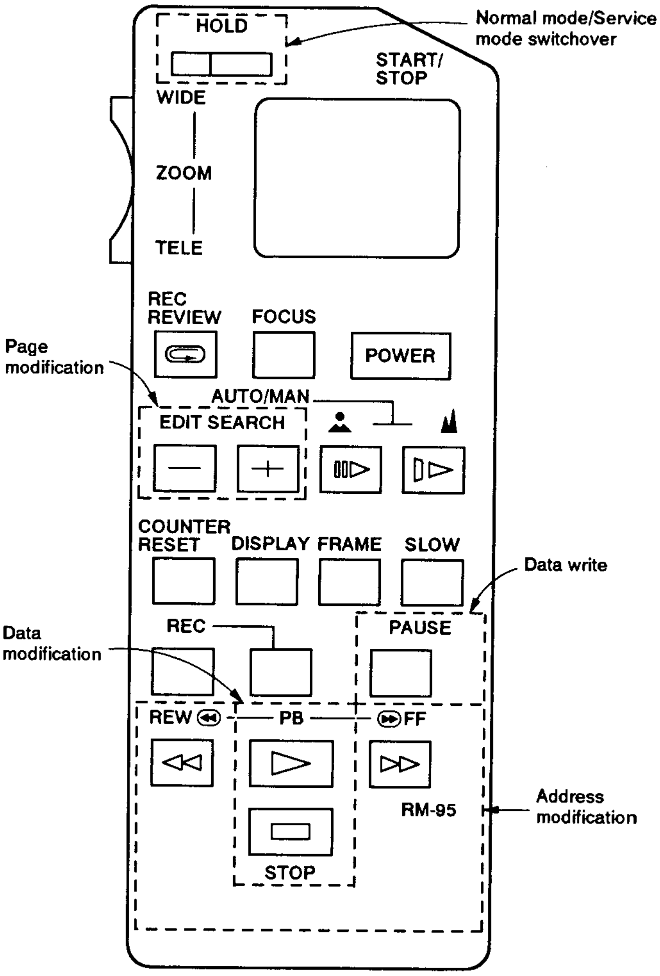
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).

(1) Service LANC memory map


Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

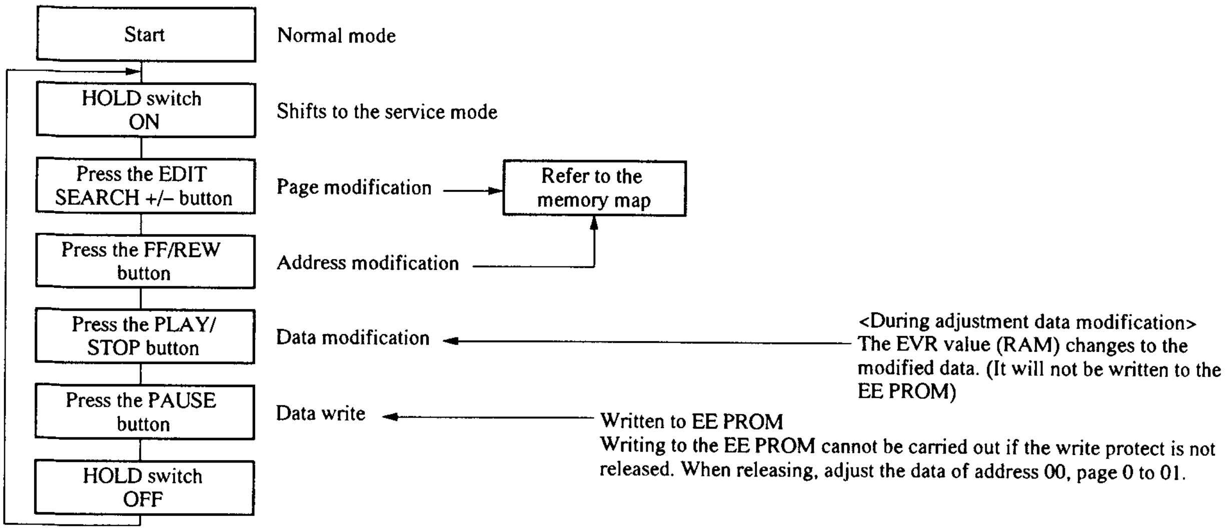

Adjusting Remote Control Unit LCD Display
0:00:00
Page
Data
Address

Adjusting remote control unit RM-95 (J-6082-053-A)


HOLD
Normal mode/Service mode switchover
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
Data modification
REC
PAUSE
REW
PB
FF
RM-95
Address modification
STOP

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 0 to 01.

Command Name	Command Function	Normal LANC command
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

……The first error code generated

Page D	Address 07

Last emergency code

…… The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode
……The operation mode when the first error is generated

Page D	Address 09

Last emergency mode
……The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

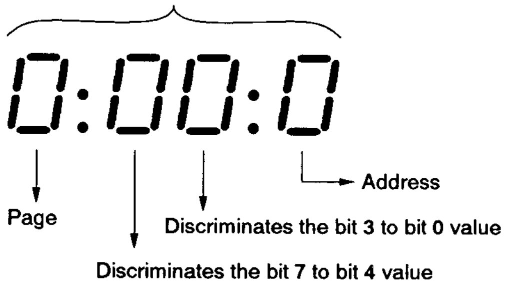
※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.
※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	-X1
37	-1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	-1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	-X2
77	-FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.

Adjusting remote control unit display


0:00:0
Address
Page
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

	Remote Control Unit Display	Bit Value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A (A)	1	0	1	0
	B (b)	1	0	1	1
	C (c)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ→	E (E)	1	1	1	0
	F (F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	HG/$\overline{\text{Normal}}$

“1”=Recording impossible
“0”=Recording possible

“1”=ME tape
“0”=MP tape

“1”=HG tape
“0”=Others

“1”=Hi8 mode playback
“0”=Normal mode playback

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

“0”=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

“1”=LP mode playback
“0”=SP mode playback

“1”=SYNC is detected
“0”=SYNC is not detected

“1”=CLOG is detected
“0”=Normal

“1”=When the PB RF signals are being playback normaly
“0”=Others

“1”=JOG mode
“0”=Other

“1”=Playback mode
“0”=Others

“1”=AUDIO MUTE: ON
“0”=AUDIO MUTE: OFF

“1”=VIDEO MUTE: ON
“0”=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

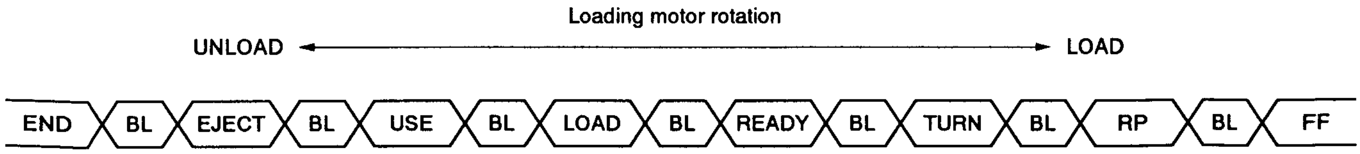
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	$\overline{\text{CC DOWN}}$
1	1	1	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (−)		START/STOP	STANDBY
Address 69 (K OUT 1)		AE PORTRAT	CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)		AE SPORTS	REMOTE ON/OFF		TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)		AE SHUTTER	EVENT	TIME	DATE	PAUSE	REC	
Address 6C (K OUT 4)				BACK LIGHT	FADER			
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF						

14. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	Data
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

15. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

*1 No mark: AEP, UK model
< >: Australian model

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		8E<8F>*1	8E<8F>*1
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	16	16
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	16	16
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	16	16
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	16	16
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	16	16
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue] Not used		
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue] Not used		
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green] Not used		
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green] Not used		
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue] Not used		
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue] Not used		
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red] Not used		
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red] Not used		
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet] Not used		
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet] Not used		
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow] Not used		
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow] Not used		
20		X2MUTE, SIRCS EJECT etc	0C	0C
21		FORCED VTR ON, CAM ON etc DATA — MODE 01 — FORCED CAMERA POWER ON 02 — FORCED VTR POWER ON	00	00

Table 9-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
22~29		Not used		
2A		Slow brake adjust (Forward)	00	00
2B		Slow brake adjust (Reverse)	00	00
2C		Still brake adjust	00	00
2D	BATT REMAIN 1	Amount of remaining battery } Battery end adjustment	A3	
2E	BATT REMAIN 2	Amount of remaining battery	9C	
2F	BATT REMAIN 3	Amount of remaining battery	97	
30~39		Not used		
3A	MT 1’CH	Not used [IC204 ③]	C0	C0
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ⑲]	C0	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ②]	C0	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	62	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ④]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ④]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	6C	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	A4	
4D	SR-IR	IR adjustment [IC203 ②]	A4	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	9B	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	95	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	6F	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	6F	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	CF	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	69	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	81	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	93	
5C~77		Not used		
78	REC MATRIX	REC matrix adjustment [IC204 ⑫] Not used		
79	PB MATRIX	PB matrix adjustment [IC204 ⑫] Not used		
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑤]	72	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑥]	91	
7C	1.7 IR	1.7 MHz IR adjustment [IC204 ⑧] Not used		
7D	1.7 DEV	1.7 MHz deviation adjustment [IC204 ⑨] Not used		
7E	AUDIO FADER	Audio fader [IC204 ⑦] Not used		
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-282 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	464 ± 5 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-282 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03+0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.00 ± 0.10 Vdc
SS 5V check	
Measurement Point	Pin ㉓ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.04 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
–9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	–8.95 ± 0.45 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-8. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7B

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN 1) 2E (BATT REMAIN 2) 2F (BATT REMAIN 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

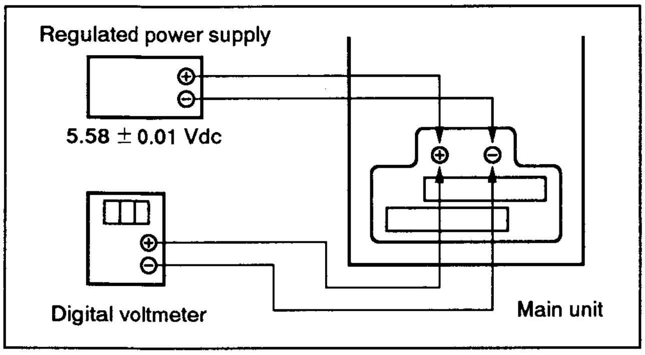


Fig. 9-5.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 01.
   (Test mode 1 setting)
4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.58 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D10.
6) Set data D10 to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Convert D10 to decimal notation, and obtain D10′. (Refer to Table 7-6. "Hexadecimal notation–decimal notation conversion table")
8) Calculate D2D′, D2E′ and D2F′ using following equations (decimal notation calculation).
   D2D′=D10′+18
   D2E′=D10′+14
   D2F′=D10′+8
9) Convert D2D′, D2E′ and D2F′ to hexadecimal notation, and obtain D2D, D2E and D2F.
10) Set data: D2D to page: D, address: 2D, and press the PAUSE button of the adjusting remote control unit.
11) Set data: D2E to page: D, address: 2E, and press the PAUSE button.
12) Set data: D2F to page: D, address: 2F, and press the PAUSE button.
13) Set data: 00 to page: 4, address: 01. (Test mode 1 release)
14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.80 ± 0.01 Vdc.
4) Check that the 🔋 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.62 ± 0.01 Vdc.
6) Check that the 🔋 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
8) Check that the 🔋 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-31 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1CP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	$t_1=0 \pm 10$ μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t_1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote control unit.

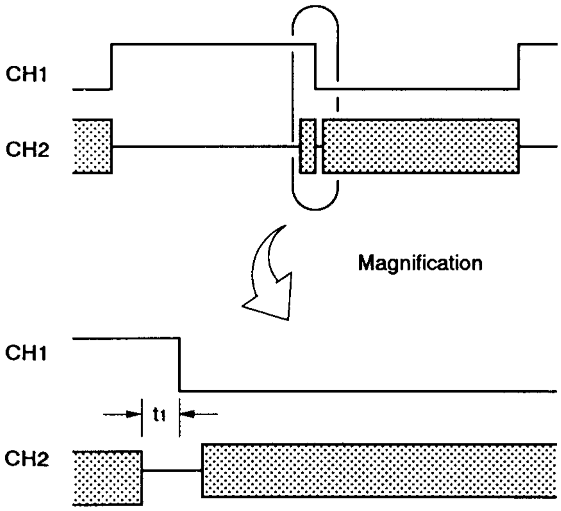


Fig. 9-6.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-3.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Chroma comb filter adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-31 board)

Note: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6C)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [-]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

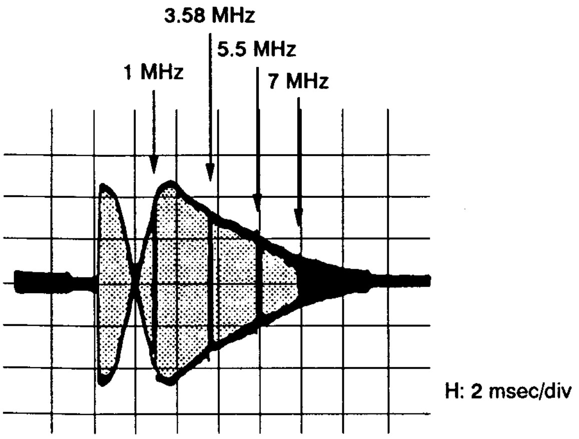


Fig. 9-7.

2. Flying Erase Check (CS-31 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.0 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.0 MHz and that the oscillation voltage is above 7.0 Vp-p.

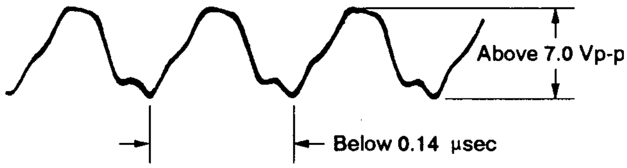


Fig. 9-8.

3. VXO Oscillation Frequency Check (VA-71 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	4433619 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC301 is 4433619 ± 70 Hz.

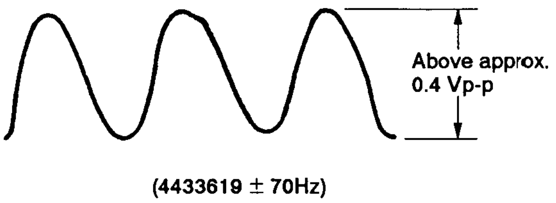


Fig. 9-9.

4. EE Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑥ of CN400 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ⑥ of CN400 at 75Ω.
After completing adjustment, remove the 75Ω resistor.

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

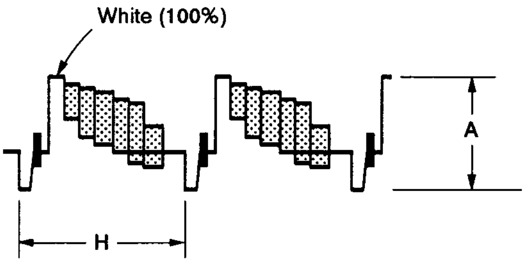


Fig. 9-10.

5. IR Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 80 mVp-p)

Connection

1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin (51) of IC201 with a jumper wire.

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

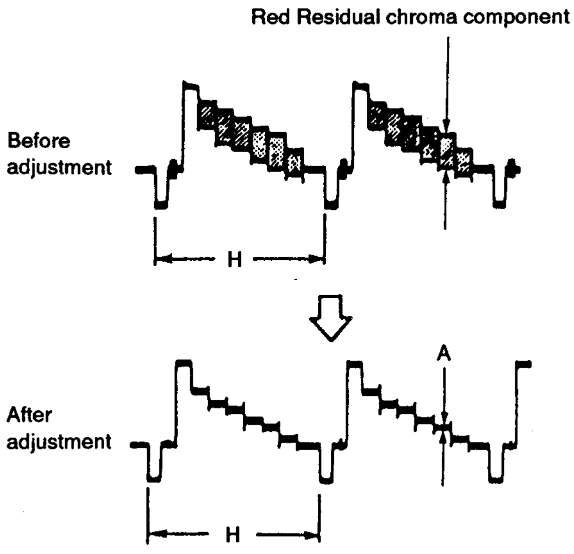


Fig. 9-11.

6. Chroma Comb Filter Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
4) Repeat steps 2) through 3).
5) Press the PAUSE button of the adjusting remote control unit.

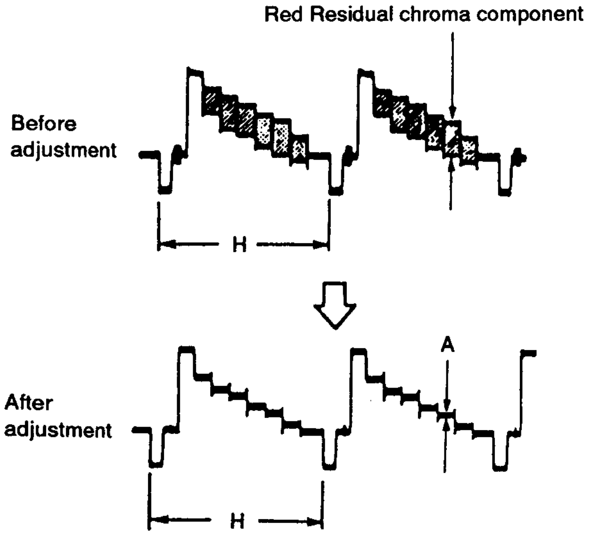


Fig. 9-12.

7. Emphasis Input Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar (without burst signal)
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

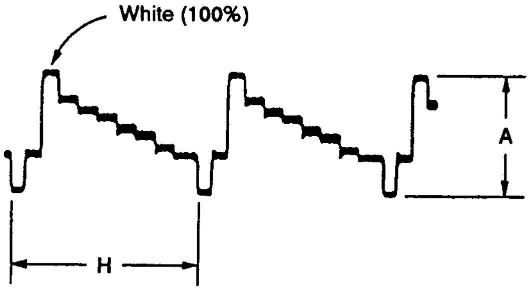


Fig. 9-13.

8. PB Y Level Adjustment (VA-71 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5CSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

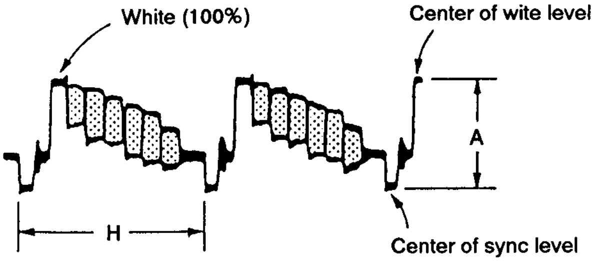


Fig. 9-14.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	A=1.0 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

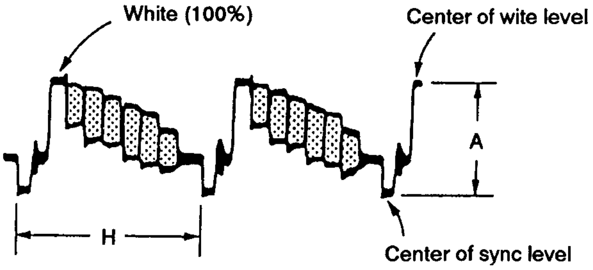


Fig. 9-15.

10. Y FM Carrier Frequency Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ㊸ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

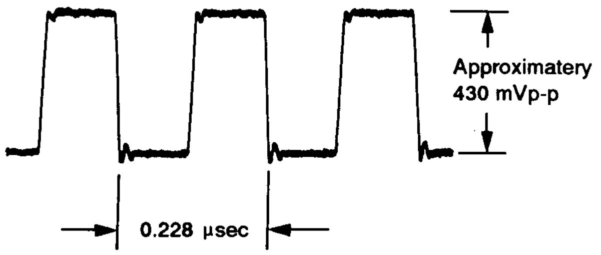


Fig. 9-16.

11. Deviation Adjustment (VA-71 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

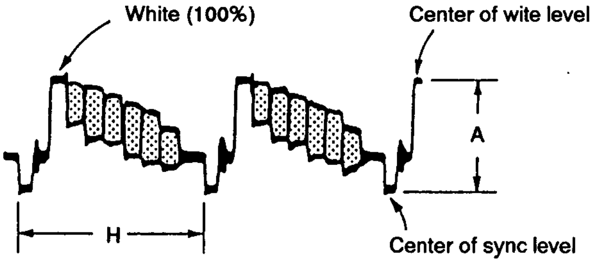


Fig. 9-17.

12. Chroma Emphasis fo Adjustment (VA-71 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum fo component

Adjusting method

1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

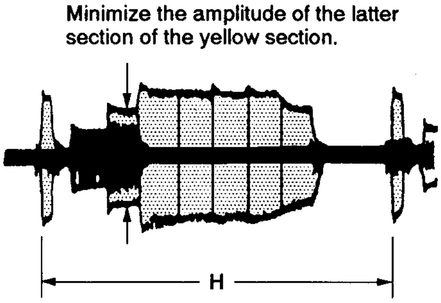

Minimize the amplitude of the latter section of the yellow section.
H

Fig. 9-18.

13. REC Y Level Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	MP type tape: A=205 ± 5 mVp-p ME type tape: A=185 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Insert a MP type cassette tape.
3) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.
5) Insert a ME type cassette tape.
6) Change the data of page: D, address: 54, and adjust so that the Y signal level (A) becames the specified value.
7) Press the PAUSE button of the remote control unit.

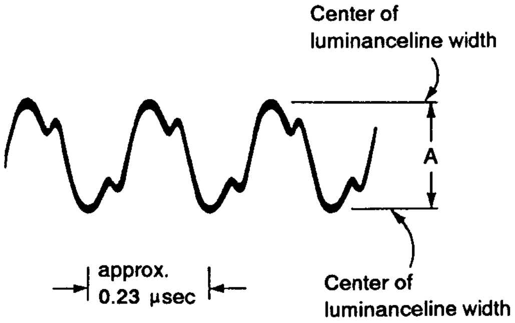

Center of luminanceline width
A
approx. 0.23 µsec
Center of luminanceline width

Fig. 9-19.

14. REC C RF Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46 (REC C RF (EE))
Specified Value	A=90 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becames the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set data: 00 to page: D, address: 47, and press the PAUSE button of the adjusting remote control unit.

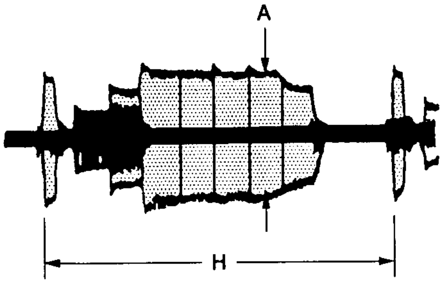


Fig. 9-20.

15. REC ATF Level Checking (CS-31 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑱ of IC501
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method

1) Confirm that the REC ATF signal level (A) satisfies the specified value.

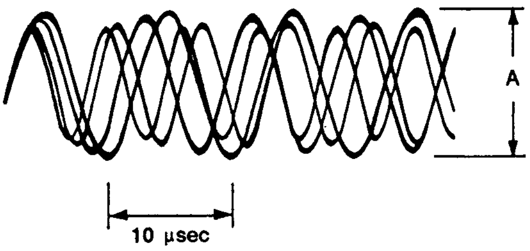


Fig. 9-21.

9-6. AUDIO SYSTEM ADJUSTMENT

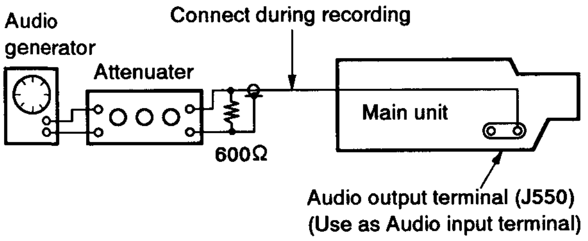
- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

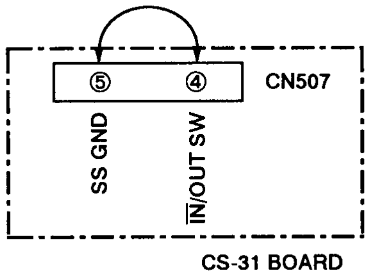
Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-22, and perform adjustments with the power switch [video or player] position.

Set the input/output select switch to the output position in Australian model.

- Connect the audio generator or the attenuator as shown in the following figure.


Audio generator
Attenuater
Connect during recording
600Ω
Main unit
Audio output terminal (J550)
(Use as Audio input terminal)

Note: To use the audio output terminal as the audio input terminal, connect Pin ④ of CN507 on the CS-31 board to GND with a jumper wire. After adjusting, be sure to disconnect this wire.


⑤
④
CN507
SS GND
IN/OUT SW
CS-31 BOARD

- Connect the audio level meter or the distortion meter to the EASY connector or the Audio output terminal.

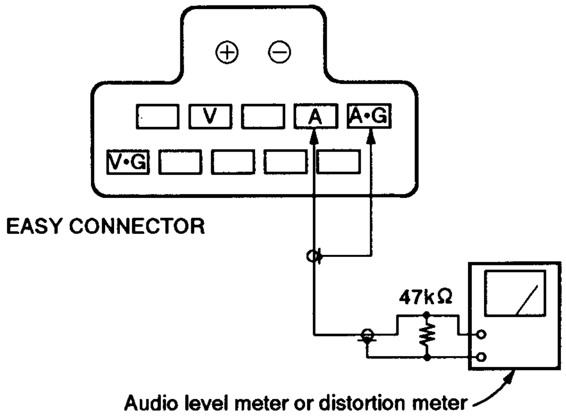

⊕ ⊖
V
A
A•G
V•G
EASY CONNECTOR
47kΩ
Audio level meter or distortion meter

Fig. 9-22.

[Adjustment Procedure]

1) Carrier frequency check
2) Recording level check
3) E-E output level check
4) IR adjustment
5) Deviation adjustment
6) Overall level characteristics, distortion check
7) Overall noise level check

1. Carrier Frequency Check (VA-71 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. Record Level Check (VA-71 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=340 ± 40 mVp-p

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
   (Read the center of the luminance line width and note down the level read.)

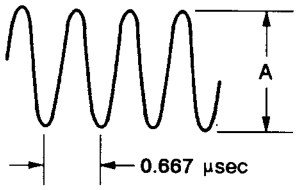


Fig. 9-23.

3. E-E Output Level Check (VA-71 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal
Measurement Point	Pin ⑲ of IC401 or Pin ① of IC400
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

4. IR Adjustment (VA-71 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP)
Measurement Point	+: Pin ⑥ of IC401 –: Pin ㊹ of IC401 (C428 ⊕)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7A and adjust so that the DC voltage becomes 0 ± 10 mVdc.
3) Press the PAUSE button of the adjusting remote control unit.

5. Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5CSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

6. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

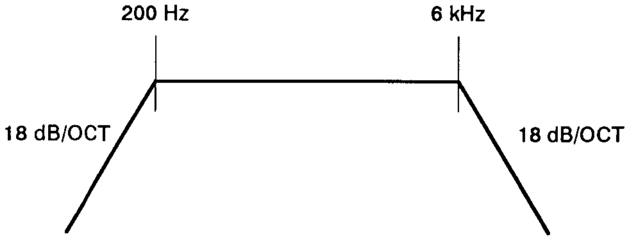


Fig. 9-24.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal is –7.5 ± 2 dBs, and that the distortion rate is below 0.5% (Note 1).

7. Overall Noise Level Check

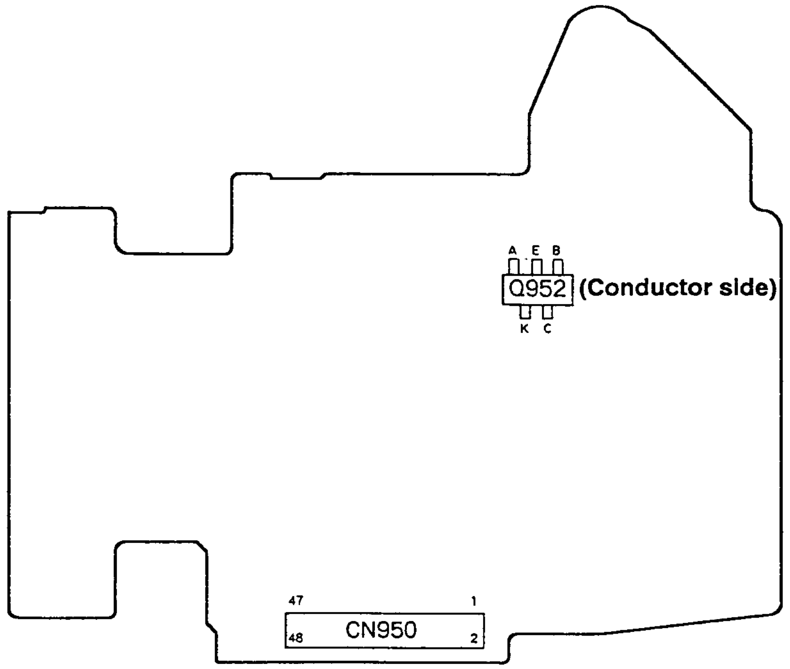
Mode	Self recording
Signal	No signal: Audio output terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

Checking method:

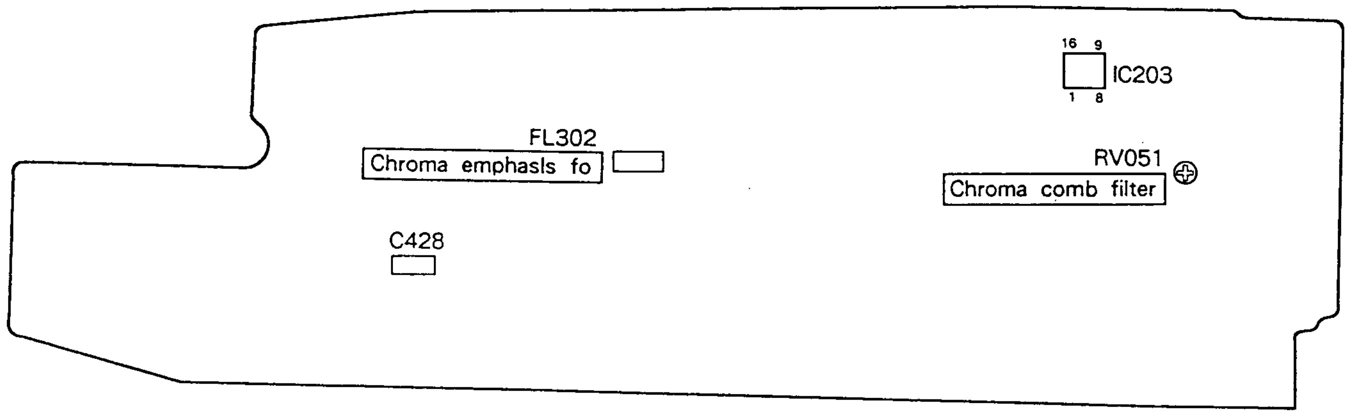
1) Insert the shorting plug to the audio input terminal.
2) Record.
3) Remove the shorting plug.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal is below –65.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

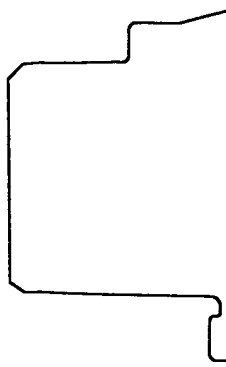
PS-282 BOARD (COMPONENT SIDE)


A E B
Q952
(Conductor side)
K C
47
1
48
CN950
2

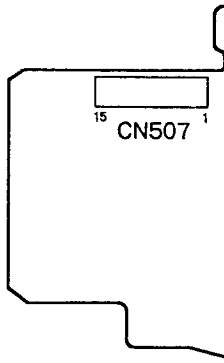
VA-71 BOARD (COMPONENT SIDE)


16 9
IC203
1 8
FL302
Chroma emphasis fo
RV051
Chroma comb filter
C428

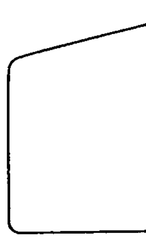
CS-31 BOARD (C



CS-31 BOARD (C

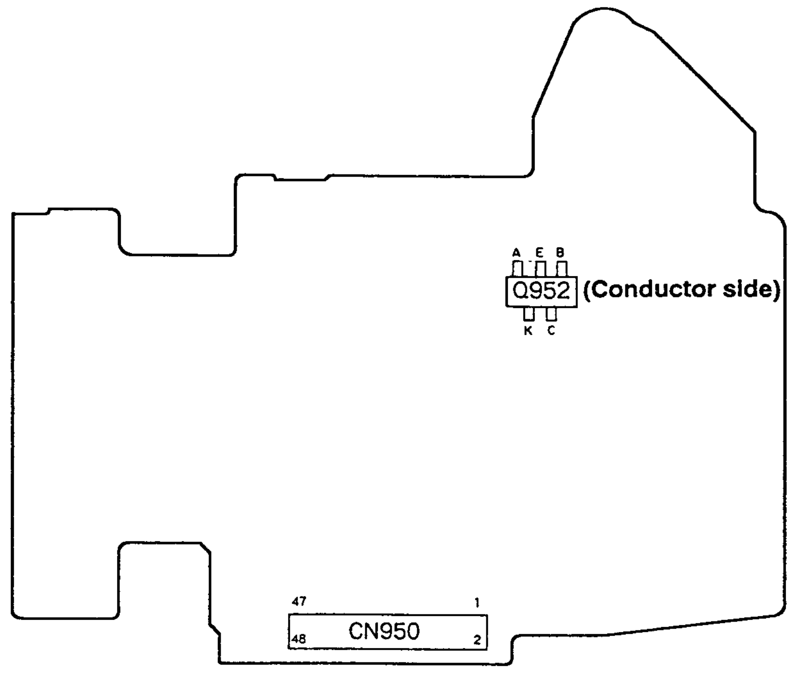


VA-71 BOA

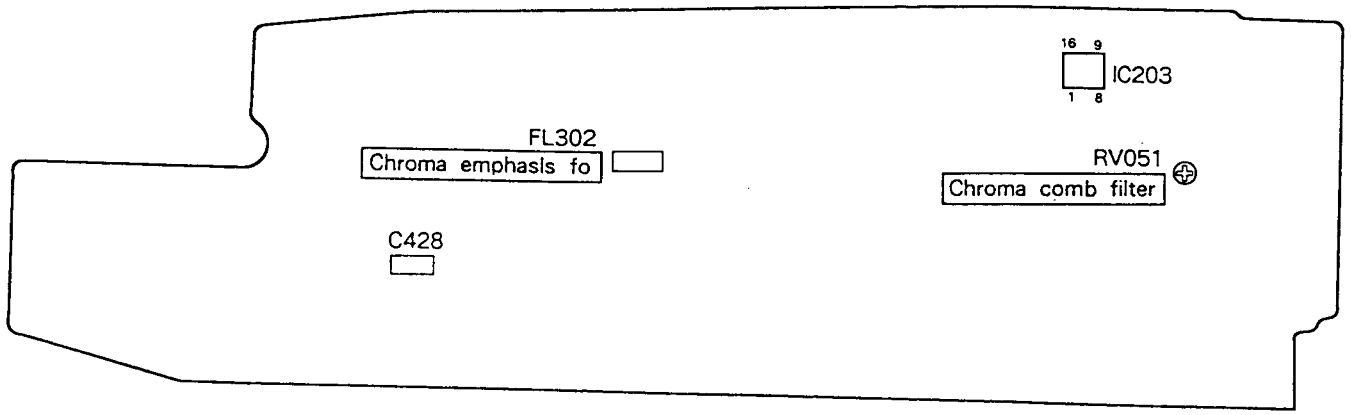


9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

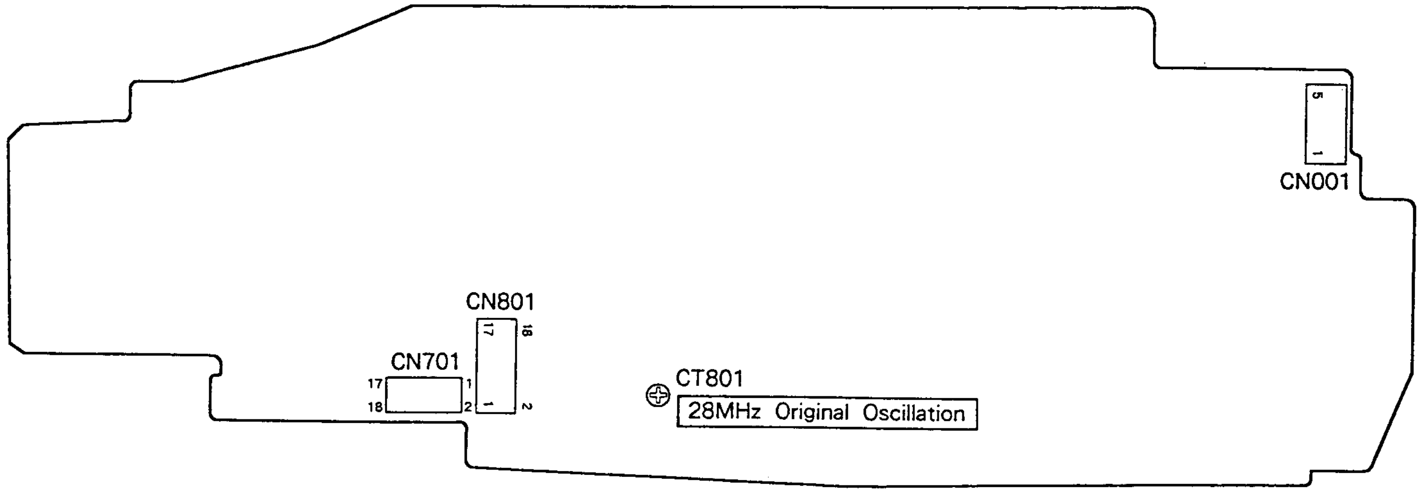
PS-282 BOARD (COMPONENT SIDE)


A E B
Q952 (Conductor side)
K C
47
1
48
CN950
2

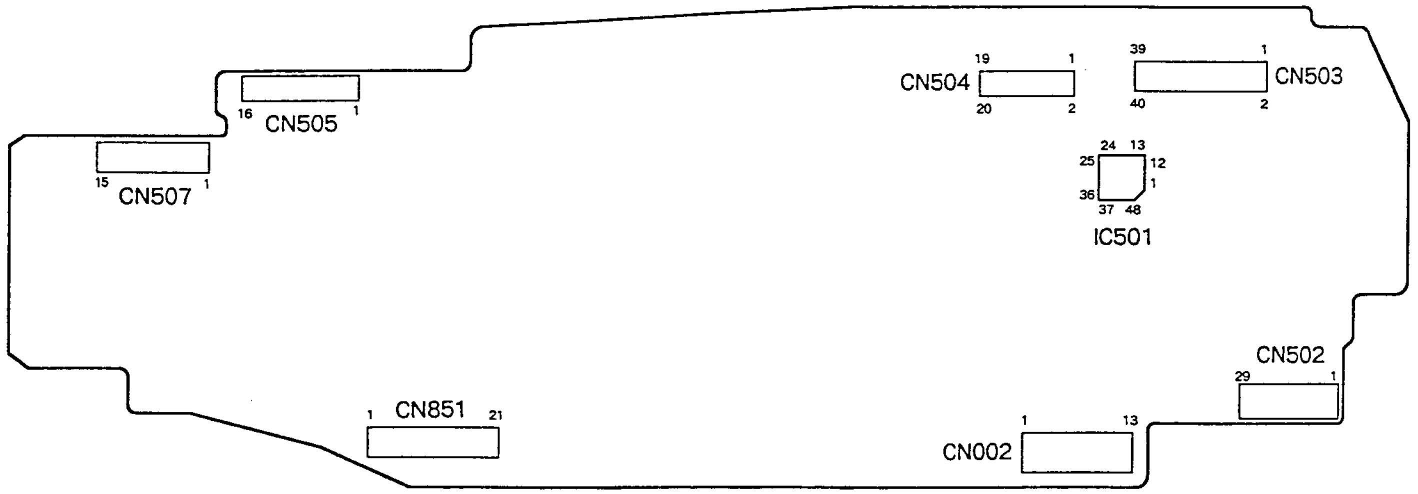
VA-71 BOARD (COMPONENT SIDE)


16 9
IC203
1 8
FL302
Chroma emphasis fo
RV051
Chroma comb filter
C428

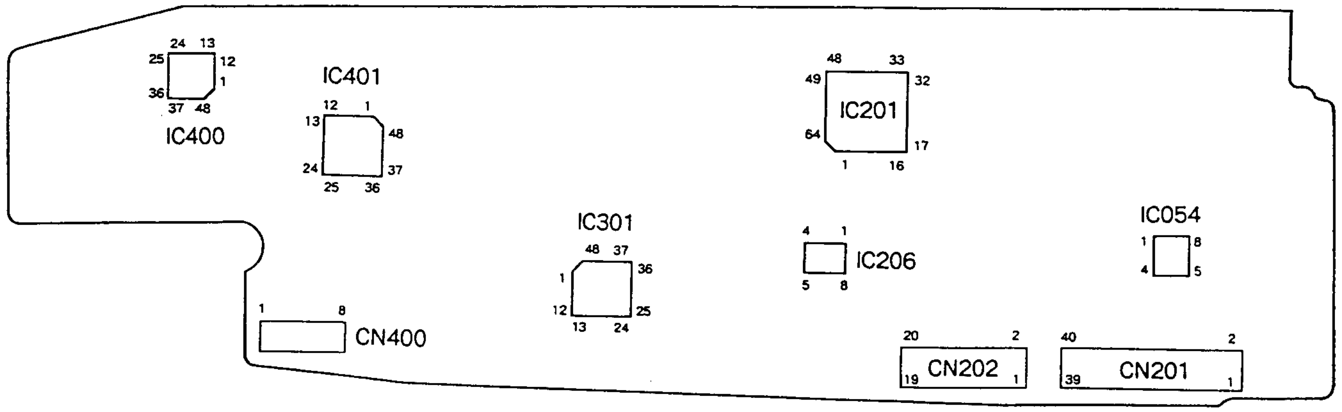
CS-31 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17
18
CN701
17
18
1
2
1
2
CT801
28MHz Original Oscillation

CS-31 BOARD (CONDUCTOR SIDE)


19 1
CN504
20 2
39 1
CN503
40 2
16
CN505
1
15
CN507
1
24 13
25
12
1
36
37 48
IC501
CN502
29 1
1 CN851 21
1 13
CN002

VA-71 BOARD (CONDUCTOR SIDE)


24 13
25
12
1
36
37 48
IC400
IC401
12 1
13
48
24
37
25 36
48 33
49
32
IC201
64
17
1 16
IC301
48 37
1
36
12
25
13 24
4 1
IC206
5 8
IC054
1
8
4
5
1 8
CN400
20 2
19 CN202 1
40 2
39 CN201 1